Rail Riders

60 – 90 minutes

In this lesson, students discover how trains provide eco-friendly transportation. They compare the amount of energy used by trains to other modes of transportation, and create geographic "snapshots" of train routes in order to gain a first-hand insight into the wide variety of travel opportunities trains offer.

Objectives

- Students will compare the rate of energy use and other environmental impacts of automobile, plane, and rail travel.
- Students will calculate the energy used by selected train routes and compare the energy used by automobiles traveling the same distances as these routes.
- Students will construct a geographic representation of selected train routes, including major cities, physical terrain, and miles traveled.
- Students will evaluate the sustainability of different modes of transportation.

Materials

- *Rail Riders Classroom Presentation*
- *Rail Riders Handout* (five copies)
- Amtrak Routes guides (at least one copy for each route)
- Colored pencils
- Large poster paper (five pieces)
- Small scrap paper (five pieces)

Background

We live in an era of abundant travel options. Cars are the primary method used for transportation by most people, with flying via commercial airlines running a close second. Yet there is another transportation option that is often overlooked nowadays even though it offers an affordable and sustainable alternative– and it's been here longer than either cars or planes. The passenger locomotive has an established place in this country's history, and is currently far ahead of planes and cars when it comes environmental friendliness. This lesson reintroduces students to the common sense of taking the train, as well as the undeniable efficiencies of this transportation choice.

Advance Preparation

Write the names of the following Amtrak routes on small pieces of paper: *Adirondack*, *Coast Starlight*, *Crescent*, *Empire Builder*, and *Southwest Chief.* Fold each piece of paper and put in a hat or basket.

Do Now

Facilitate a short class discussion by asking students the following questions:

- How many of you have taken a trip on a train? (**Note:** You may need to clarify with students the difference between a subway, a short-distance commuter train, and a passenger train.)
- Do you think a train uses more or less fuel per person than a plane?
- Do you think a train uses more or less fuel per person than a car?

Mini-Lesson

1. Tell students that traveling by train uses less fuel per person than either a plane or a car. Explain that they will compare the amount of energy used by these modes of transportation, and then explore more about the opportunities provided by rail travel.
2. Project *Rail Riders Classroom Presentation*. Guide students through each of the slides. Encourage students to ask questions and share comments on the information presented in the slides. When reviewing the amount of British Thermal Units (BTUs) by mode of transportation, be sure to explain that these amounts represent an average. The efficiency of each mode of transportation increases the more people on board. A full plane is more efficient than one that is half-empty.
3. When you get to the last slide that shows the overview map of Amtrak routes, ask students the following questions:
    - What do you see?
    - To which regions of the country do the routes of this map go?
    - What are some of the major destinations of these routes?
    - What is the shortest length of the routes on the map? the longest?
    - What kind of terrain do the routes travel through?
    - Besides being more fuel efficient, what might be some other benefits of rail travel?

Activity

1. Explain to students that they are going to work in groups to create a geographic "snapshot" of five existing Amtrak routes that can help riders better understand the environmental and personal benefits of rail travel.
2. Divide the class into five groups. Invite one person from each group to select one of the five Amtrak routes you wrote on paper ahead of class from the hat.
3. Give each group a copy of *Rail Riders Student Handout* and review the directions as a class. Each group will create a snapshot for their assigned Amtrak route on a large piece of poster paper. Their snapshots will include:
    - A map of the route, including the outline and labels for each state
    - Origin and destination cities
    - Any other major cities along route
    - Visual representation of the terrain along route

- Number of miles for the route
- Amount of British Thermal Units (BTUs) for the route by train and by car

4. Give each group a piece of large poster paper and a copy of the guide for their assigned Amtrak route. Monitor groups as they work, allowing approximately 30 minutes for groups to create their snapshots. (**Note:** Information about route mileage is available at www.amtrak.com on the "Timetables" tab.)
5. Invite each group to share their snapshot, and make sure they point out all of the specific details they have included along their route. When all the groups have presented, encourage your students to comment on the differences between the routes.
6. Wrap up the activity by asking students these questions:
   - Which of these routes would you most like to travel someday and why?
   - What are the advantages of taking a train instead of a car?
   - What are the advantages of taking a train instead of a plane?
   - Why is rail travel a more sustainable transportation choice for the environment?

Assessment

Ask students the following question: *What do you now know about traveling by train that you did not know before?*

Modifications

- Pre-teach unfamiliar vocabulary concepts to ***English Language Learners***. Give them a list of important words from the lesson and have them work with a partner to create an illustrated glossary of terms. Each term should include a definition and a simple visual. Consider the following terms for this lesson: efficiency, energy use, sustainability.
- Review the Amtrak Route Guides ahead of time to highlight key sections for ***Learners Reading Below Grade Level***. Have group members read these sections aloud together and annotate key information that they can use to make their route snapshots.
- Create heterogeneous groups for the Activity. Designate specific roles for students and have ***Students with Special Needs*** select their role ahead of time or share their role with a peer. Roles might include: researcher, cartographer, mathematician, artist, and/or writer.

Extensions

- Extend this lesson by having students research and trace the history of train fuel over time. Trains are now powered by diesel and electricity, but were once powered by coal, wood, and even horses.
- Extend this lesson by having students write a poem about the reasons why train travel is a more eco-friendly way to travel.