



## One-Day Lesson: Sustainable Transportation

Concepts of sustainable transportation are best understood when presented in connection with the aspects of transportation that negatively impact sustainability. This unit focuses on the list of non-sustainable components of transportation identified by Black (2005), which include:

1. Diminishing petroleum reserves
2. Harmful global atmospheric impacts
3. Diminished local air quality
4. Fatalities and injuries
5. Congestion
6. Noise
7. Harmful biological impacts
8. Inequity

Since students personally interact with transportation on a daily basis, the use of familiar case studies for this unit allows students to relate directly to the topic of sustainable transportation rather than having it presented as an abstract concept. Demonstrating best case scenarios also allows students to realize that solutions for sustainability actually exist, that the subject is not all “doom and gloom,” and that we can learn from others.

This short unit asks students living in Phoenix, Arizona to critically examine the transportation systems employed by their city using a sustainability and sustainable transportation framework. It then provides a few best case transportation planning examples from another location - this unit was used in a French class, so the examples are from cities in France, but any example that demonstrate sustainable transportation practices may be substituted. The unit can be extended to include a short activity that allows students to apply their knowledge through acting as transportation planners in order to improve Phoenix transportation systems sustainability.

The unit progresses chronologically through the following topics:

**Topic 1:** Short Introduction to Sustainability (three pillars) and Sustainable Transportation; PowerPoint slides 1-4 (10 minutes)

**Topic 2:** Modes of Transportation (10 minutes)

*\* Recommended place of insertion for 10-minute activity*

**Topic 3:** Sustainable Transportation in France; PowerPoint slides 5-12 (15-20 minutes)

**Topic 4:** Transportation Planning for Phoenix; PowerPoint slide 13 (15-20 minutes)

## Sustainable Transportation

### **Essential Questions: What does sustainable transportation look like? How can transportation in Phoenix become more sustainable?**

*The objective of this lesson is to explore the broader impacts of our transportation choices.*

*At the end of the lesson, students will be able to:*

- 1. Verbalize reasons for their personal transportation preferences*
- 2. Understand transportation preferences different from their own*
- 3. Verbally defend their characteristic identifications (most efficient, safest, most economical, most sustainable) for the modes of transportation*
- 4. Realize at least one cost and benefit for each mode of transportation*

### **Standards Addressed:**

- Foreign and Native Language Standards; S4, S6,*
- Social Studies Standards; S4: Geography; C5: Environment and Society S5: Economics; C1: Personal Finance*
- Science Standards; S1: Inquiry Process; C1: Observations, Questions, and Hypotheses; C4: Communication Science Standards; S3: Science in Personal and Social Perspectives; C1: Changes in Environments; C2: Science and Technology in Society*
- Health Standards; Standard 3: Students demonstrate the ability to practice health-enhancing behaviors and reduce health risks*

**Themes:** Trade offs, scale

**Skills:** Written communication, oral communication, evidence based thinking, teamwork, problem solving

### **Teaching Instructions for 10-minute Activity**

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| 1. Print out four transportation mode signs and adhere to four different walls in the classroom.  |
| 2. Prepare students by telling them you will be asking them a series of questions that will refer to the transportation modes displayed on the walls. Briefly introduce each mode by reading the sign and the associated definitions: <ol style="list-style-type: none"><li><i>Modes of Transportation</i> – includes automobile, transit, cycling, and walking</li><li><i>Automobile</i> – travel by car, SUV, or truck</li><li><i>Transit</i> – travel by bus, subway, light rail, or commuter train</li><li><i>Cycling</i> – travel by bicycle</li><li><i>Walking</i> – travel by foot</li></ol> |
| 3. Students should use their own experiences and opinions to decide which mode they believe best answers each question. Let students know: <ol style="list-style-type: none"><li>They must decide on one mode for each question.</li><li>No one may abstain from a question.</li></ol>  |

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<p>c. There is no “correct” answer - they should be prepared to defend their answer.</p>
<p>4. Have every student stand up. Verbally ask them the following questions in order:</p> <ol style="list-style-type: none"><li>Which mode do you like to use the best?</li><li>Which mode is the most efficient?</li><li>Which mode is the safest?</li><li>Which mode is the most economical choice?</li><li>Which mode is the most environmentally friendly?</li><li>Which mode is the most sustainable?</li><li>What mode would you like to be able to use (or use more) but feel that you can't?</li></ol> <p>5. After asking each question, give students a few seconds to move and stand in front of the wall that represents their answer to the question.</p> <p>6. Once all students have made their decisions, facilitate a 1-2 minute discussion by pointedly asking at least one student standing in front of each represented mode to defend their choice. *Be sure to encourage participation by selecting different students to speak first. If there are many students standing in front of a single mode, open the floor to another student to add to the first student's response. Also allow students to respond or contest each other's positions. In order to keep each question to the 1-2 minute limit, make sure to cut discussions off when the time is up no matter where the discussion is at that point.</p> <p>7. Before moving on to the next question, point out the distribution of students among the each mode so that students may begin to realize which questions reached a consensus among the group and which were highly variable.</p>
<p>8. Have students return to their seats. Verbally summarize the discussion by answering the following questions:</p> <ol style="list-style-type: none"><li>Which questions had an overwhelming consensus and which did not?</li><li>What are some positive and negative aspects for each mode of transportation that came up during the activity (You could invite the students to answer this one)?</li><li>What do the students' opinions implicate for the future of sustainable transportation planning in Phoenix (i.e. if we enjoy using our cars and we deemed them the safest, most efficient, and most economical mode of transportation, is it wise to completely eliminate their use)?</li></ol>

### Additional Resources:

Black, William R. (2005). Sustainable Transport: Definitions and Responses. Transportation Research Board. Integrating Sustainability into the Transportation Planning Process, TRB. 35-43.

Institute for Transportation & Development Policy (ITDP) [www.itdp.org](http://www.itdp.org)

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