

## Sustainability Teachers' Academy Lesson Plan

### Mini-Debate: Transportation

#### Topics Covered

Transportation  
City planning and design

#### Grades

6-8

#### Duration

55 Minutes

#### Sustainability Competencies

Values Thinking  
Future Thinking  
Systems Thinking  
Collaborative Thinking

#### Online Resources

[www.valleymetro.org](http://www.valleymetro.org)

#### Key Questions

What are real world examples of sustainability problems and solutions? How do sustainability problems impact the environment, society, and the economy? How does one evaluate the effectiveness of a sustainable solution?

#### Overview

In this activity students will argue for or against a proposed extension of the metro Phoenix light rail based how this project will impact the environment, society, and economy.

#### Objectives

Students will be able to:

- Carefully read and interpret factual information
- Verbally communicate information to their peers
- Articulate the Environmental, Social, and Economic impacts of sustainability problems and solutions
- Present reasonable arguments based on reliable evidence
- Make informed judgements using the best available evidence

#### Materials

Projected or printed copies of the "Light Rail Expansion Factsheet"

#### Teacher Preparation

This activity should be preceded by introductory lessons on sustainability such as Defining Sustainability, and Choosing Sustainability. Students should also be familiar with conducting basic research and developing effective arguments for debate.

#### Background Information

Sustainability is a complex subject that often results in areas of controversy and debate. Each problem in sustainability is complex, and can have numerous possible solutions. Often times, the most popular solutions to a problem have unintended and unrecognized negative consequences. For this reason, it is important to thoroughly investigate any possible solution to a sustainability problem. This involves carefully considering evidence, listening to the perspectives of others, and making an informed decision.

The mini-debate format allows students to represent different sides

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of a proposal in a small group called a triad. This consists of three participants:

- A moderator who listens to both sides of the debate, evaluates the arguments presented, and eventually casts a vote in favor of one side
- A representative for the motion (here called the Pro Side)
- A representative against the motion (here called the Con Side)

### Recommended Procedures

1. Project the Light Rail Expansion Factsheet or provide copies of the factsheet to students. Inform students that they will be discussing the extension of the light rail system in metro Phoenix. As assigned by the instructor, some students will argue for the extension, others will argue against it, while a third group of students listens to the arguments, asks questions, and eventually votes on the proposed expansion.

2. Organize students into three groups: Moderators, Pro Side, Con Side. Each group will work together to develop materials and prepare for the mini-debate.

3. Provide 10 minutes to prepare for the Pro Se Court.

Moderators should create and organize questions to ask the Pro and Con representatives during the mini-debate, and develop rubrics or strategies used to evaluate the evidence and arguments presented by each side.

Pro and Con representatives should discuss and organize evidence from the resources provided, and formulate the best evidence to support the argument they will make.

Be sure to emphasize that students should frame their arguments, evaluations and questions in terms of the Three Pillars of Sustainability (in other words, does the solution under consideration promote the Environment, Society, and the Economy?).

4. Separate students into triads and begin the debate as follows:

- 2 minutes pro argument
- 1 minute moderator questions
- 2 minutes con argument
- 1 minute moderator questions
- 1 minute pro rebuttal
- 1 minute con rebuttal

5. Allow 3 minutes for each moderator to assess the arguments, and cast his/her vote. Moderators should be encouraged to justify their decisions with the class. Tally the votes on the whiteboard.

6. End this activity with a debriefing about light rails and public transportation, discuss how each of the Three Pillars of Sustainability is impacted by this topic and whether the solution proposed effectively promotes the Environment, Society, and the Economy.

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### Extensions

Students can look for other examples of sustainability problems in their daily lives, develop their own possible solutions, and evaluate them using the mini-debate format.

### Vocabulary

**Light Rail:** A form of urban public transportation that uses lightweight, high capacity streetcars

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### Next Generation Science Standards

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking questions (for science) and defining problems (for engineering)	ESS3.A Natural resources	Cause and effect: Mechanism and explanation
Analyzing and interpreting data	ESS3.C Human impacts on Earth systems	
Obtaining, evaluating, and communicating information		

### Common Core English Language Arts

Reading: Informational Text	Writing	Speaking & Listening	Language
RI.6.1, RI.6.7, RI.7.1, RI.7.7, RI.8.1, RI.8.7	N/A	SL.6.1, SL.6.2, SL.6.4, SL.7.1, SL.7.2, SL.7.4, SL.8.1, SL.8.2, SL.8.4	N/A

### Common Core Mathematics

6 through 8	9 and 10
N/A	N/A

### Other Common Core

Science	History/Social Studies
CCSS.ELA-LITERACY.RST.6-8.1, CCSS.ELA-LITERACY.RST.6-8.4, CCSS.ELA-LITERACY.RST.6-8.7	CCSS.ELA-LITERACY.RH.6-8.1, CCSS.ELA-LITERACY.RH.6-8.4, CCSS.ELA-LITERACY.RH.6-8.7