

Lesson Nine: Is the California High-Speed Rail A Viable Solution to Environmental Pollution?

These instructions are meant to be a guide. You may use this guide directly or adapt as you see fit to your classroom.

Part 1: Introduction to the California High Speed Rail Project

The lesson begins with an introduction to the California high speed rail project. The most difficult aspect of this lesson for students to understand, and the most important, builds on one of the central ideas of economics: decision making.

Tell students: Today we will be looking at one of the central ideas of economics: decision making. But oftentimes, economists must make decisions without actually knowing all of the information they would like to have ahead of time or without knowing all of the consequences of the decision. They make decisions when the answers are uncertain. This process is what economists often face when making decisions about infrastructure.

To introduce this idea, pose several questions to the students for them to think about, write about, talk about with a partner, and then discuss as a class:

- Do you go to the store or mall if you do not know what the parking situation is?
- Do you buy an expensive ticket to a game or concert if you do not know if the game or concert will be good?
- How do you decide what college to go to without knowing exactly what the college will be like?
- Do you date someone, knowing that the odds are likely you will break up?

Most students have probably faced decisions such as these before.

Ask students: Let's think about these situations. In order to make these difficult decisions, what information do you need? What bias might you encounter? If you are deciding whether to date someone, you may want to know what they like to do for fun, so you could ask their ex, who may be biased in their opinion of the person. If you are deciding whether to go to a concert or not, you may ask a friend who says the concert was great, but the band is a metal band and your friend loves metal music but you do not. This bias will need to be taken into account when you make your decision.

An extension of this activity is to ask students what other questions they face that they must answer without having all the answers. They may begin to state other information they would need or types of bias they may encounter.

To put these questions in economic terms for students, tell students: An economist may ask this question as, “How do we complete a cost-benefit analysis to make a decision without really knowing the costs or the benefits?” To look at this issue in more depth, we are going to investigate the proposed California high speed rail project.

Tell students: Deciding whether to build the California high speed rail project is a decision that must be made without knowing the consequences, as is often the case when deciding whether to construct infrastructure projects. The high speed rail project will extend from San Francisco, CA to Los Angeles, CA, a distance of 383 miles (approximately the distance from Boston, MA to Philadelphia, PA or from Denver, CO to Santa Fe, NM or from New Orleans, LA to Birmingham, AL).

To put this high speed rail project into a context your students can understand, give students a relative distance for your geographic location. For example, what city is approximately 400 miles from where your school is?

Ask students: What options do you have for travel transportation if you want to go on a trip to a place approximately 400 miles from where you live?

Typical answers will include plane, car, bus, or train. Students can discuss the costs and benefits of each mode of transportation. In this situation, like the situations posed above, the answers are uncertain. Will there be traffic? Will a flight be delayed or canceled? In order to address these uncertainties, students would want to seek information, consider the bias of their sources, and ultimately make a decision, the same process economists use when making decisions, especially those related to infrastructure projects.

Tell students: For distances that are a bit long to drive but short to fly (approximately 400 miles, or five to six hours), there could be an option for a high speed train. The picture of a car from this rail project can be projected so students can see what the train looks like.

Tell students: This train has been proposed as a solution to environmental pollution caused by planes and cars. But deciding whether the train is a viable alternative is difficult, since there is only soft evidence about the potential consequences of such a large infrastructure project – there is no hard data to consider in the cost-benefit analysis since the values are all projected. There is some hard evidence about the pollution caused by driving and by flying, and the costs and benefits, externalities, and consequences of those two forms of travel can be discussed. But is a high speed train a solution to that environmental pollution?

The purpose of this introduction is to have students start thinking of the rail project as an alternative form of transportation and to put the proposal for the project in context. Students will now read some of this soft evidence to determine if the California high speed rail project is a viable solution to environmental pollution.

Part 2: Background Reading

Students read the background reading on the California high speed rail project to gain more context. The reading addresses the projected plan and cost of the rail project in addition to the funding solutions that have been developed. The background reading is designed to give students an understanding of the project, both what has already been decided and what could still be decided.

Ask students to read the background in pairs or small groups so that they can discuss as they read. In some classes, it will be more appropriate for students to read the documents individually and discuss them with other students or as a class afterwards or to read the document as a whole class.

Ask students: What is the proposal? What is your initial reaction to this project? What additional information would you like to have in order to make a decision about whether the rail project is a viable solution to environmental pollution?

Part 3: Document Analysis

Ask students to read the documents addressing the environmental impact of the California high speed rail project. Students should read the documents in small groups and go over the questions as a group after each document. In some classes, it will be more appropriate for students to read the documents individually and discuss the questions with other students afterwards. Students can also read the documents together as a class, discussing as you go. Students should answer the questions that follow each document to ensure their understanding.

Tell students: Think about the different ways that the high speed rail could impact the environment (e.g., air pollution, water pollution). How likely are these effects? Are they probable, possible, improbable, or impossible? By the end of the lesson, students should understand what each document contributes to the larger discussion of the California rail project as a viable solution to environmental pollution.

Part 4: Developing an Argument

Before students start discussing whether the rail project is a viable solution to environmental pollution, make sure that students understand the documents, what each of them contributes to this discussion, and what biases may appear in each document based on the source of the information. Then ask them to answer the questions on the final page of the student handout.

At the end of class, ask students: What are the possible environmental effects of the high speed rail? Are these effects positive or negative? How probable are these effects? Are they probable, possible, improbable, or impossible? How important are the effects?