

Subject: Mathematics

Grade: Eighth

Standard: # 3 Ratios, Proportions, and Percent  
# 4 Computation and Estimation  
# 6 Measurement  
# 9 Problem Solving  
#10 Reasoning  
#12 Connections

Key Concept: Students recognize and make mathematical connections with other school subjects and with everyday experiences.

Generalization: Students use, gather, and understand technical data and apply the results to a real-life problem.

Background:

This lesson should be presented as a midyear to an end-of-year project. Students should have covered estimation, rates, and ratios. It would be helpful if they had already done some real-life data gathering. If students are not familiar with financial concepts, payments, and gas mileage, these topics should be discussed during the project.

Students should work in pairs to complete this lesson. All tiers will complete a series of questions to help them be able to answer the question “How much does it cost to drive a car a mile?” The idea behind the lesson is to have the students incorporate more than just the cost of gas. A good sample of the types of items, tax, insurance, depreciation, etc., to include and the necessary calculations can be found in the book Math for Humans, ISBN# 0-9656414-7-3, pages 11-1 through 11-4. This part of the lesson could be adjusted for readiness by limiting the items which students will include in their costs. Student pairs will first need to identify a vehicle, then gather the data, and finally do the calculations. The second part of the lesson is to estimate the cost of a trip using this same vehicle.

This lesson is tiered in *process* according to *readiness*.

**Tier I: *Basic Learners***

Pairs of students are given a state map and should plan a trip between two cities within the state. The two cities should be a fair distance apart and it may be most appropriate for the teacher to choose the two cities. Depending on the level of your students, you might also give them a road atlas and choose two cities in adjacent states. Students are to plan a route and estimate the cost of the trip using the “per-mile” estimate for their vehicle.

**Tier II: *Grade Level Learners***

Pairs of students are given a road atlas which contains maps for all the states. Students are to plan a trip between two cities in non-adjacent states. Students are to plan a route and estimate the cost of the trip using the “per-mile” estimate for their vehicle.

**Tier III: *Advanced Learners***

Pairs of students are given a road atlas which contains maps for all the states. Students are to plan a trip between two cities which are on opposite coasts. Students are to plan a route and estimate the cost of the trip using the “per-mile” estimate for their vehicle.

**Assessment:**

The first part of the lesson should be graded for accuracy. The second half of the lesson could be presented to the class by the various pairs.

An extension of the lesson would be to have the students make a comparison of the various vehicles and determine which is the most economical to drive.