

Analyzing Traffic Data

By Virginia Callaghan

Target Grade/ Subject: 8th grade Science

Duration: 3 days (Day 1: introduction and expectations, Day 2: collection and analysis of data, Day 3: presentations)

Lesson Overview

Students will collect and analyze data, and create graphs using computer technology. They will then read and interpret the graphs and present the information to the class.

Sources Consulted

Bruff, Tom, Transportation Planning Engineer, SE Michigan Council of Governments (SEMCOG).
Transportation Workshop: Urban Transportation, held March 21, 2015, coordinated by Michigan Technological University.

Learning Objectives

Students will be able to:

1. Analyze data from the SEMCOG (South East Council Of Governments) website and create graphs.
2. Communicate their findings via an oral presentation.

Benchmarks Addressed

NGSS: Practice 4: Analyze and Interpret Data: Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. Construct, analyze, and/or interpret graphical displays of data and/or large data sets to identify linear and nonlinear relationships.

NGSS: Practice 8: Obtaining, Evaluating, and Communicating Information: Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.

Materials Needed

Computers (one for every two students)

Advance Preparation

Review with students how to create graphs

Vocabulary

X-axis – the principal or horizontal axis of a system of coordinates, points along which have a value of zero for all other coordinates

Y-axis- the secondary or vertical axis of a system of coordinates, points along which have a value of zero for all other coordinates

SEMCOG = South East Council Of Governments (SEMCOG) <http://www.semco.org>

Compare – how things are similar

Contrast – how things are different

Vehicle crash – where one vehicle hits an object or another vehicle

Intersection - a place where two or more roads meet

Focus Question:

Which local intersection is the most dangerous (i.e. has the most car crashes)?

Is there something about this intersection that may cause these accidents to occur?

Procedure

Engage: Ask the students if they have ever seen or experienced a car crash? Describe how the accident occurred. Show the students video clips (found on YouTube) of “fender bender” accidents at an intersection.

Explore: Students will work with partners and explore the SEMCOG website (using the ‘Crash and Road Data). Students will investigate crash data for different intersections around the city. They will choose an intersection that they think is the most dangerous based on their research.

Explain: Students will collect and analyze data on their chosen intersection. They will make a claim on which intersection they believe is the most dangerous. Evidence that supports their claim will be collected and formatted into graphs, pictures, and writing. (Claim Evidence Reasoning: A statement or conclusion that answers the original question/problem. Evidence is the scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim. Reasoning is a justification that connects the evidence to the claim. It shows why the data counts as evidence by using appropriate and sufficient scientific principles.)

Evaluate: The students will present their findings as an oral presentation. They may use Power Point, Prezi or charts as visuals in their presentations.

Assessment: Assessment will be in two parts: i) Students will be assessed on their reports: graphs and writing (claim, evidence and reasoning); ii) Students will be assessed on their presentations.