

Safety and Traffic Control of Ramp Signals

Students act in the role of a city engineer to determine if a city should install ramp signal lights to pace merging traffic. For grades 6-7.

INTRODUCTION

Culminating Activity:

You are a YouTube documentary filmmaker. Your city is attempting to combat new reports of increasing traffic and car accidents on freeways. In response, the City is planning on installing on ramp signal lights to decrease traffic and car accidents. But local citizens are complaining that ramp signals are a nuisance. Sensing interest, you have decided to write a point/counterpoint script for a YouTube video on ramp signals. The script should contain an introduction on ramp signals are and how they work.

Objectives (Students Will Be Able To...)

- Students evaluate the effectiveness of ramp signal lights on traffic flow.
- Students write a point/counterpoint script.

ACTIVITIES IN THIS LESSON

Conceptual Development

Lecture

Activity

The lesson centers on vocabulary development, which focuses on spelling *optimize*, *occupancy*, and *sequence* (and their variants), knowing their definition, and using the words in sentences.

The lesson begins with short video on ramp signaling.

Upon completion of the video, the instructor asks questions to check for understanding and engage students.

Checking for Understanding & Engagement

- Summarize the main point of the video.
- State a fact from the video that you remember.

- How is *occupancy* defined? Say *occupancy* aloud.
- What does the word *optimize* mean?
- How do you spell *optimize* and *optimization*, *sequence*, and *sequential*?
- In what areas have you seen on ramp signals?
- Have your parents ever commented on them? If so, what do they say?

Activity

The instructor leads a discussion on ramp signals. The instructor either (a) hands out prints of the Ramp Metering page from the USDOT or (b) use the information from the page to present a direct-instruction lecture.

Checking for Understanding & Engagement

- Describe in your own words the purpose of ramp signal lights.
- What are some differences and similarities between on-ramp signals and street signals?
- Do you think ramp signals are necessary? Why or why not?

Research

Research/Annotate

Activity

The teacher reads aloud and explains the culminating activity and how to complete it. Students are then formed into pairs. The culminating activity is provided to the pair-shares. In this part, students in pairs will research what on ramps are, how they work, and their effectiveness on safety and traffic.

The teacher then guides students on ways to research and complete a point/counterpoint, using examples of point/counterpoint scripts found on the web (See Resources below). From their research they will decide what information is relevant and create a point/counterpoint.

Pairs of students will establish a description for on ramp signals and how they work. The teacher then employs the think, pair, share method of instruction and have pairs share their descriptions of ramp signals. A few descriptions can be shared out loud for the class.

Checking for Understanding & Engagement

- As time increases from left to right explain what happens to occupancy.

- Summarize what the chart tells you about ramp signals.
- State one critical feature of a good point/counterpoint script.
- Under which conditions are on-ramp signals desirable?
- Under which conditions are on-ramp signals undesirable?
- Why doesn't the ramp signal light contain a yellow (amber) light?
- Why is it important to understand the purpose of on ramp signals?
- When do you think it is preferable to allow two cars to pass at one, rather than one?
- Suppose you worked for a city that wanted traffic to flow as smoothly as possible. What kind of features would you want to add to existing ramp signals to optimize traffic flow?

Resources and Materials

- How to Write a Point/Counterpoint Essay
- [Point/Counterpoint: A Method for Teaching Critical Thinking](#)

Career Development

Group Work

Activity

In this activity, students explore the field of Youtuber film production. They perform online searches for active Youtubers willing to discuss how to get into the field, what skills are needed, what kind of equipment they use, and how much they earn in advertisement and donations.

Checking for Understanding & Engagement

- State a fact about YouTube filmmaking that you learned.
- What speaking skills does a YouTube filmmaker need to exhibit?
- What classes do you take that you think could help you become a successful YouTuber?
- Does it seem that making money on YouTube is easy?
- What is one advantage and one disadvantage of making YouTube films for a living?

Point/Counterpoint

Lecture

Activity

Students will complete their point/counterpoint script. The teacher will employ the think-aloud method of instruction in order to emphasize why creating a point/counterpoint is important.

As part of the think-aloud, the teacher would model why they would (a) land on the point/counterpoint tool to complete the activity, (b) figure out how to plan for it, and (c) decide what should go in it.

Questioning for Engagement

- What information would make a point/counterpoint most effective?
- Do you think on ramp signals are necessary, and why?

YouTube Film Creation (Optional)

Independent Practice

Activity

In this activity, students create a short YouTube point/counterpoint video centered on whether on-ramp signals are desirable.

NOTE: This activity requires equipment and prior experience with YouTube filmmaking and is therefore optional.

SUMMATIVE ASSESSMENT

Assessment Type: Writing Samples

The instructor will review the point/counterpoint script and grade it according to a common rubric. Points of interest include:

- Is the information factually correct?
- Are both sides presented fairly?
- Do the counterpoints counter the point, and vice versa?

Notes:

- Development of this lesson plan was funded by The Fresno State Transportation Institute (FSTI).
- This lesson plan was developed using the approach described in *The Art and Science of Lesson Design* by J. Walkup and S. Squire.

- Throughout the lesson, students will complete a Metacog Log (*The Art and Science of Lesson Design*, p. 112) to assess their own understanding and confidence.

Lesson Times

Conceptual Development: 10 minutes

Research: 15 minutes

Group Work: 10 minutes

Point/Counterpoint Script: 15 minutes

Career Development: 20 minutes

YouTube Film Making (Optional): 2 days

Industries / Subjects / Grades

Industries / Pathways

- Transportation
- Operations

K-12 Subjects

- English-Language Arts
- Technology Education

Grade Levels

- 6, 7

Standards and Objectives

Standards

California's 2013 CTE Standards

- **CTE.T.A.7.2** Recognize the need for traffic signals, signs, and markings

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