

## Absolute Value with Proof Paragraph

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### Lesson Overview

In this lesson, students will use proof paragraph as a structure to analyze the process used to convert information in a chart into a line graph. The essential question for this lesson is “How can you use numbers and symbols to represent mathematical ideas?”

### Standards Addressed

7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

### Disciplinary Literacy Best Practices

Proof Paragraph

### Lesson Plan

Time Required – One or Two 45-minute Class Periods

Disciplinary Vocabulary: line graph, chart, x-axis, y-axis, origin, ordered pairs, number line, absolute value

Materials Needed:

- Informational Chart
- Graph Paper
- Marker Boards and Dry Erase Markers

Assessment:

Completed Proof Paragraph

## Engage

- The teacher will begin the lesson with a discussion of patterns noticed in the mathematical writings students have previously completed in class. For the class in the video, some strengths were the details provided by students and some weaknesses were the opening and closing statements written.
- Teacher asks: “How are closings similar to opening statements, yet different?”
- Students will reflect on their own writing, considering questions such as:
  - Are my opening statements strong? Do my opening statements represent what my writing will address?
  - How do my closings restate my opening in a different way?
  - Are my details in order and make sense? Are my details on topic, clear and concise?

## Explore

- Teacher models how to use a Proof Paragraph to prove that you can use a number line to find the absolute value of a number. This content is content from the previous grade level and is being used to demonstrate the Proof Paragraph process.
- Questions for Think Aloud:
  - What is absolute value?
  - How can I convey to my teacher in a proof paragraph that I know what absolute value is?
  - What words might I use as I solve the problem?
  - What transition words might be used to move from one step to the next?
  - What is the relationship between the steps I used to solve the problem and my written sentences?
  - How could we prove that the steps in my model paragraph work with other absolute value tasks?
  - How might the sentences used in this paragraph be adapted to create a different paragraph proving the same mathematical concept?
- After analyzing the model proof paragraph, students create their own proof paragraph for translating information in a chart or table into a graph.
- Teacher asks, “What is an example of a situation in which it is best to represent a relationship or information in a table? In a graph? As a written expression? As an equation?”
- Additional Questions
  - What are tables used for? What types of information are represented in a table?
  - What are graphs used for? What types of information have you seen in different types of graphs?

- When is it best to represent mathematical ideas in words? When might this be the easiest way to convey information?
- When might an equation be the best way to convey information?

### Explain

- Students share Proof Paragraphs with one another and analyze one another's work to provide feedback.

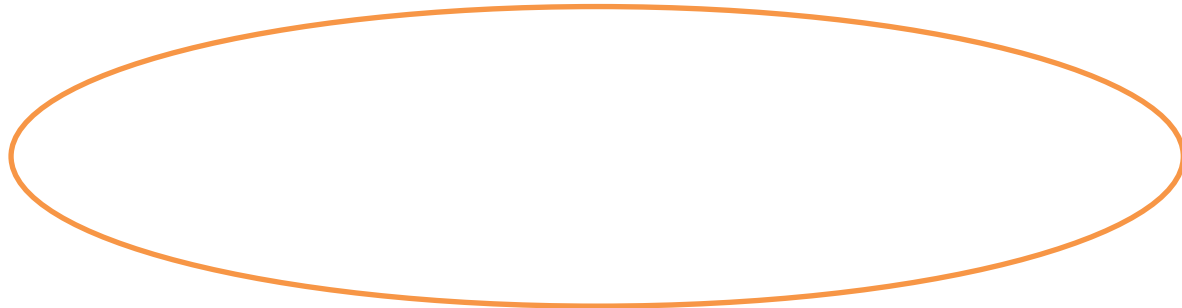
### Teacher Reflections and Biographical Information

This lesson was taught to a small group of higher performing seventh grade students, and can be adjusted to any grade 4-12 lesson in any subject area. The graphic organizer is very helpful to struggling learners.

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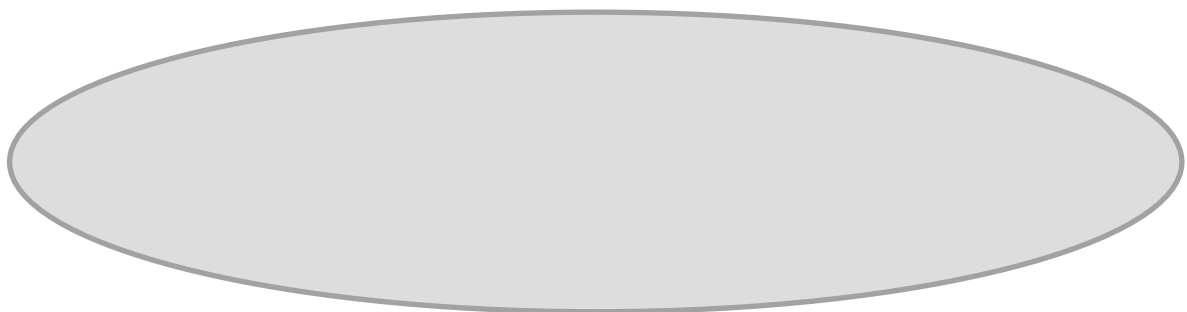
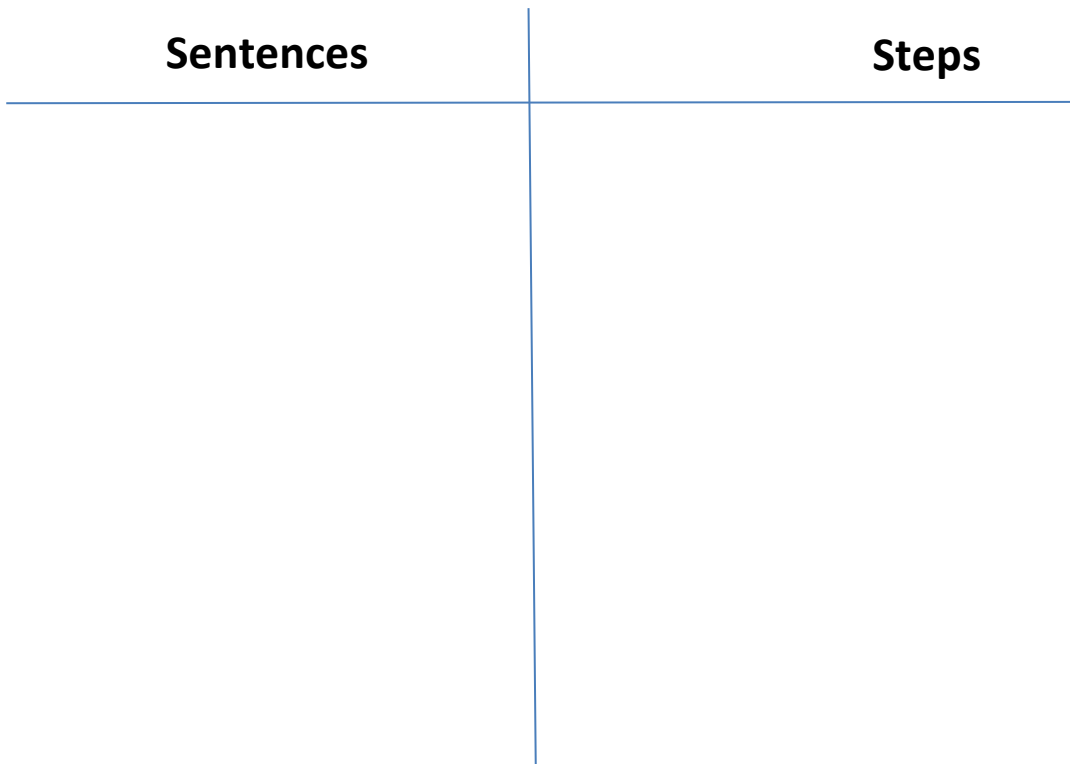
# Proof Paragraph Graphic Organizer

Opening Sentence



**Sentences**

**Steps**



Closing Sentence