

THINKING
LIKE A
MATHEMATICIAN

Supporting Questions
For the Frame

**Exhibit 7.14—
Context Frame: Mathematics**

STAGE A

1. Who is the author? How is the author connected to the topic of the text?

STAGE B—Text:

Following the model on page 79, insert the specific, aligned CCSS for the lesson.

Then, select complex texts aligned with the rigor of learning expected in the identified CCSS.

Formulate text-specific questions of high cognitive demand aligned with the complexity of the texts. The following two questions may be included.

- ▶ What ideas in the text can be explored mathematically?
- ▶ What does the math reveal? What is the number story?

4. What do I predict will be the author's message?

2. What areas of mathematics are connected to this text?

3. What deeper meaning is revealed in the text?

Exhibit 7.15—Reading Like a Mathematician Subtext Guide

Stage C—Purpose

How does mathematical analysis, or the number story, support the author's ideas or claims? Or, how does it refute or disprove the author's ideas or claims?

Stage C

How does the number story deepen your understanding of this text?

Stage D—Motive

Based on your understanding at this point, should this text be changed? How?

Stage D

What new questions does the number story raise? How might these questions be explored mathematically?

Stage A

Using the “**context frame for mathematics**” (Exhibit 7.14), read the questions in **Stage A** that are located on each side of the frame.

Beginning with number 1, respond to the questions. Write your response directly on the context frame in the space under number 1. Consider the supporting questions below in your responses:

- 1. Who is the author?** How is he or she connected to this topic or issue? (top of the frame)
 - What makes the author qualified to write about this topic or issue?
 - Why do I believe the author is qualified to write about this topic or issue?
 - What connection does the author have to this topic or issue?
 - How does the author assure the reader of his or her commitment to the topic?
 - How does the reader know the author is honest and ethical?
- 2. What areas of mathematics are connected to this text?**
 - How did the author infuse mathematics into the text?
 - How did the infusion of mathematics into the topic or issue support the text?
 - How will my understanding of mathematics clarify the text?

- What areas of mathematics did the author include in the text?
- How can I use the knowledge and mathematics from this text to improve my life?
- What literacy actions did the author use to propel and support the mathematics used in the text?

3. What deeper meaning is revealed in the text?

- What do I believe about this topic or issue?
- What do I want to know about this topic or issue?
- Why is the infusion of mathematics into this topic or issue important to me?
- How will my mathematical knowledge improve my understanding of this topic or issue?

4. What do I predict will be the author’s message?

- What new insights will I gain using my knowledge of mathematics to decode this text?
- How can I apply these insights to my current knowledge of the text?
- How will the author’s message and my understanding of mathematical concepts improve my life?
- Using mathematical concepts and the author’s text, what new learning will I apply in my life?

Stage B

Formulate text-specific questions aligned with the complexity of the texts. These questions must demand students to cite text evidence in their responses. Consider the additional supporting questions below in your response:

What ideas in the text can be explored mathematically?

- How did the author represent these ideas graphically?
- What does the mathematical representation of the numbers add to the text?
- How did the author's use of mathematical representation and graphic representation of the number story improve the reader's ability to comprehend and interpret the message within the text?

What does the math within the text reveal about the content?

- What does the math within the text reveal about the author?
- How does the math within the text support the author's premise?
- How do the math and the story behind the numbers improve the reader's ability to comprehend the text?

Now that we have completed the first two stages in the Four-Stage Text Investigation for Disciplinary Literacy by thinking critically about the context and text in Stages A and B, the adolescent reader must now *engage* with the text by identifying purpose, the number story, and new

questions the number story raises. The next two stages—**Stage C**, the impersonal subtext, and **Stage D**, the personal subtext—produce the reader's personal meaning.

Stage C

Using the "**subtext guide for reading like a mathematician (Exhibit 7.15)**", read the questions in **Stage C** that are located inside the boxes.

Beginning with **Stage C**, respond to the questions. Write your response directly on the subtext guide in the space under Stage C. Then move to the next question. Consider the supporting questions below in your response:

Purpose (identifying the impact mathematical processes contribute to defining the text):

How does mathematical analysis, or the number story, support the author's ideas or claims?

- How does mathematical analysis refute or disprove the author's ideas or claims?
- Why is either of these messages important to the reader in the present?
- What do data generated mathematically add to the reader's overall sense of validity?
- How does a mathematical process add fidelity to the text?
- How do numbers in the text support the author's outcomes and refute questions of accountability?

Stage D

Concluding the Disciplinary Literacy Four-Stage Text Investigation with **Stage D**, respond to the questions. Write your responses directly on the subtext guide (**Exhibit 7.15**) in the spaces under Stage D. Consider the supporting questions below in your response:

Based on your understanding, should the author's text be changed?

- Why was the author's inclusion of mathematical representations within the text appropriate for the reader?
- How did the author consider the needs of the reader when including mathematical representations in the text of the message?
- Why does the inclusion of mathematical representations enhance the text of the message and resonate with the reader?
- What mathematical representations added clarity to the text and how does the author of the text use mathematics to create imagery to capture the reader's attention?

What new questions does the number story raise? How might these questions be explored mathematically?

- How does the author of the text use graphic representations to create imagery for the reader?
- How do the language chosen and the mathematical representations included by the author create a powerful influence on the reader?