Determining What Comes Next: Focusing on Sequencing Skills

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The PD Team

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Session Objectives

- Review High Impact Indicators and relationships
- Focus on a selected skill—sequencing—of the High Impact Indicators
- Explore how sequencing skills are represented across content areas and share selected research-based strategies for skill building
High Impact Indicators Across the Content Areas
A Quick Overview

What are *High Impact Indicators*?

- Important skills that are widely applicable
- May currently receive light coverage during GED® test preparation
- Lend themselves to straightforward instruction
Targets → Indicators → Application

- **Assessment targets** describe the general concepts that are assessed on the GED® test
- **Indicators** are fine-grained descriptions of individual skills contained within an assessment target
- **Application** describes what to look for in student work

With HILs, It’s About Relationships

- Assist instructors in creating instructional plans that address the maximum number of skills
- Assist students in developing skills to apply in multiple ways and in a variety of contexts
Determining What Comes Next

Sequencing Across All Content Areas

Your Turn . . .

Where do YOU use sequencing skills?
Sequencing Defined

A skill used to arrange events, items, or objects in a predetermined or created order

Common examples: alphabetizing; listing in chronological order (e.g. events); creating instructions; or counting

What Sequencing Does . . .

• Makes use of a structured approach in determining the next steps
• Requires students to slow down in order to engage with the details and the order in which the details are presented
• Exposes students to the discipline of interacting with text—not simply as words—or visual images on the page but as ideas supported by text structures
(Why) Does Sequencing Matter?

- It provides a solid foundation for a number of additional skills:
  - Attributing
  - Comparing and contrasting
  - Proceduralizing
  - Prioritizing
  - Recognizing numeric patterns

Sequencing Across the Content Areas

- **Social Studies**
  - Identify the chronological structure of a historical narrative and sequence steps in a process

- **RLA**
  - Order sequences of events in texts

- **Science**
  - Reason from data or evidence to a conclusion

- **Mathematics**
  - Search for and recognize entry point for solving a problem and plan a solution pathway
Building Sequencing Skills in RLA
Implementing the Process in the Classroom

Let’s Go Deeper: RLA

<table>
<thead>
<tr>
<th>Indicator</th>
<th>What to look for in student work. The student can:</th>
</tr>
</thead>
</table>
| R.3.1: Order sequences of events in texts. Primarily measured with literary texts. | • Locate a single, discrete event or plot point in texts.  
• Identify chronological and non-chronological sequences of events within texts.  
• Describe the progression from one event to the next in a text.  
• Re-order events presented in non-chronological order in texts into chronological order.  
• Re-order events provided in chronological order texts into a different order (e.g. cause-and-effect, etc.) in order to determine the text’s meaning. |
Reasoning through Language Arts

Three Strategic Tools to Build Skills

- **Close reading** (with questioning and discussion)
- **Text structures** (how text is organized and patterns in organization)
- **Graphic organizers** (making thinking visible)
Two Questions Close Readers Ask . . .

What happens in the text?  

How does this part relate to what happens before and after?

Building Sequencing Skills

1. Start by using short passages—informational from a variety of sources, as well as some literary sources (storytelling uses sequencing skills too).

2. Let students guide the way. Begin by asking students what they notice about the text and use their observations for discussion.

3. Keep discussions focused on the text.
Building Sequencing Skills . . . Ask

- What did you notice first about the text?
- What is the main idea and how does the author support for the main idea?
- In what order is the support for the author’s main idea introduced?
- Finally, engage students by asking where else might the same skill could be used.

Why Text Structures Are Important

- Text structure refers to how the text is organized.
- Teaching students to recognize common text structures found in expository texts can help students monitor their comprehension.
- Attempting to identify the text structure early on encourages the reader to question how subsequent sections of the text fit into the identified text structure.
Types of Text Structures

Teaching Text Structures

- Introduce the idea that expository texts have a text structure.
- Introduce the following common text structures—description or list, compare/contrast, cause and effect, and order/sequence.
- Show examples of texts that correspond to each text structure.
- Have student find signal words within the texts.
- Examine topic sentences that clue the reader to a specific structure.
- Model the writing that uses a specific text structure.
- Have students try writing paragraphs on their own that follow a specific text structure.
Graphic Organizers for Sequencing

In RLA . . .

Good sequencing skills allow students to:
• Engage with text and organize evidence and details to support arguments
• Create outlines and write using them
• And—you guessed it—can also help organize their ideas to write constructed responses
## Sequencing in Social Studies

Implementing the Process in the Classroom

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### Indicator for Social Studies

<table>
<thead>
<tr>
<th>Indicator</th>
<th>What to look for in student work. The student can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSP.3 a. Identify the chronological structure of a historical narrative and sequence steps in a process.</td>
<td>• identify (potential or actual) causes for given effects. • identify (potential or actual) effects for a given cause. • identify examples of cause-effect relationships in texts.</td>
</tr>
<tr>
<td>SSP.3 c. Analyze cause-and-effect relationships and multiple causation, including action by individuals, natural and societal processes, and the influence of ideas.</td>
<td>• fully explain how or why one event or set of circumstances in a cause-effect relationship caused another. • fully explain a sequence of causes leading to a given effect. • identify multiple causes of a given event or set of circumstances.</td>
</tr>
</tbody>
</table>
An Example

Three Strategic Tools to Build Skills

- **Close reading** (think “reading like a historian”)
- **Comparing points of view (POVs) of the same historical event** (from primary and/or secondary sources)
- **Graphic organizers** (making thinking visible …cause and effect, timelines, and compare and contrast)
Organizing Data – It’s Sequencing

During the 2005-2006 academic year, a survey of the holdings of university research libraries and rank was done in the United States and Canada. It was found that Syracuse University, in New York, had 2,392,147 holdings, and was figured to rank eighty-first. Harvard University ranked first with 13,369,855 holdings. The University of Connecticut was ranked fiftieth place, and reported 2,626,066 holdings. The Massachusetts Institute of Technology reported 2,448,647 holdings, and was ranked in seventy-third place.

(Source: Association of Research Libraries)

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>1</td>
<td>13,369,855</td>
</tr>
<tr>
<td>U. of Connecticut</td>
<td>50</td>
<td>2,626,066</td>
</tr>
<tr>
<td>Mass. Institute Tech.</td>
<td>73</td>
<td>2,448,647</td>
</tr>
<tr>
<td>Syracuse University</td>
<td>81</td>
<td>2,392,147</td>
</tr>
</tbody>
</table>

Tables present data in rows and columns that:
• can be compared and contrasted
• can be transferred easily to another graph
• may help determine type of graph to use

Close Reading + Data Literacy Skills

• Plan and integrate opportunities to help students understand that the same skill—sequencing—is also an integral part of Social Studies
• Provide practice in using sequencing skills to create a chronology or to determine cause and effect
Primary Source Analysis Tool

**QUESTION**
What else do you wonder about it?

**OBSERVE**
What did you notice first?
Describe anything about the text that looks unfamiliar.
How is the information arranged?

**REFLECT**
What was the purpose of the document?
Who was the audience?
What events were happening around the creation of this document?

The Library of Congress

A Few Social Studies Graphic Organizers

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In Social Studies . . .

When reading primary and secondary sources, students need to be able to:

- Order significant events on timelines
- Understand the connections between and among people, places, and events
- Identify cause and effect—both simple and complex

All of these require students to develop and use sequencing skills.

Your Turn

Where else could you use sequencing skills in Social Studies?
# Sequencing in Science

Implementing the Process in the Classroom

## Indicator for Science

<table>
<thead>
<tr>
<th>Indicator</th>
<th>What to look for in student work. The student can:</th>
</tr>
</thead>
</table>
| SP.3.b Reason from data or evidence to a conclusion | • identify a hypothesis for a given scientific investigation.  
• differentiate between an appropriate hypothesis and a poorly conceived hypothesis.  
• Use a hypothesis to support or challenge a given conclusion.  
• Identify a hypothesis for a given data set.  
• Refine a hypothesis to more appropriately to suit a scientific experiment. |
Science Example

Newton's second law of motion states that the acceleration of an object is dependent on the object's mass and the amount of force applied to the object. The table shows data from an investigation of Newton's second law.

<table>
<thead>
<tr>
<th>Net Force (N)</th>
<th>Mass (kg)</th>
<th>Acceleration (m/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Which statement describes the pattern established in the data included in the chart?

- A. A doubling of the net force increases acceleration 4 times when the object's mass is constant.
- B. A doubling of the net force decreases acceleration 2 times when the object's mass is constant.
- C. A doubling of the mass decreases the acceleration of the object by half when the net force is constant.
- D. A doubling of the mass increases the acceleration of the object 2 times when the net force is constant.

Three Strategic Tools to Build Skills

- **Close reading** (with questioning and discussion)
- **Experimental design** (building applications tied to real world examples)
- **Graphic organizers** (making thinking visible)
Can your students . . .

- Design the correct process for an experiment?
- Determine a method for collecting data?
- Design a scientific investigation based on a given hypothesis?

The Scientific Method

It’s a sequencing process!

Observation → Define Problem → Propose Hypothesis → Gather Evidence → Test Hypothesis → Reject Hypothesis → Retain Hypothesis → Develop Theory
## Scientific Method + Sequencing + Real World

<table>
<thead>
<tr>
<th>Observation and Problem</th>
<th>It takes me too long to get to work. I need to find a better route. Looking at the map, I know that there are many different routes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>If I use Route X, I will arrive at work more quickly.</td>
</tr>
<tr>
<td>Gather Evidence and Test the Hypothesis</td>
<td>I drive to work the same time each day at the same speed taking a variety of routes, including Route X.</td>
</tr>
<tr>
<td>Analyze Results</td>
<td>I look at the different route times. I find that Route X is faster than the original route that I took or any of the alternates.</td>
</tr>
<tr>
<td>Draw Conclusion</td>
<td>Route X is the best route. However, I may want to test my hypothesis when driving home as traffic patterns may change.</td>
</tr>
</tbody>
</table>

## In Science . . .

When reading science texts, students need to be able to:

- Order information (e.g. scientific investigation)
- Understand and explain the connections between scientific concepts/theories
- Justify a text-based-line of reasoning
- Incorporate elements (evidence) from texts and/or graphics

All of these require students to develop and use sequencing skills.
Your Turn

Where else could you use sequencing skills in Science?

Sequencing in Mathematical Reasoning

Implementing the Process in the Classroom
### Indicator for Math

<table>
<thead>
<tr>
<th>Indicator</th>
<th>What to look for in student work. The student can:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MP.1 d:</strong> Recognize and identify missing information that is required to solve a problem.</td>
<td>• deconstruct word problems.</td>
</tr>
<tr>
<td><strong>MP.5 c:</strong> Identify the information required to evaluate a line of reasoning.</td>
<td>• identify missing information.</td>
</tr>
<tr>
<td></td>
<td>• determine information needed to solve a problem.</td>
</tr>
<tr>
<td></td>
<td>• problem solve through a step-by-step process.</td>
</tr>
</tbody>
</table>

#### A Math Example

Fredley opened a food truck business to sell food on the street. On day 2, the business earned $112. On day 5, the business earned $187. Fredley assumes that the earnings will continue to increase at the same rate. How much will the business earn on day 10?

- Edwards: $305
- Williams: $304
- Johnson: $304
- Anderson: $275

Click on a name to select and submit. If none of the above choices is correct, select the option that best fits the answer.

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At the Heart of Mathematical Reasoning . . .

- Sequencing (a series of steps leading to a solution—e.g. problem solving)
- Structured thinking about the problem and the tools available
- Attention to detail (close reading with word problems)

What Students Need . . .

Increase conceptual knowledge
Build their reading skills
Depend less on rote memory
Implement the correct procedure
Increase conceptual knowledge

Hartley opened a food truck business to sell food on the street. On day 2, the business earned $112. On day 5, the business earned $357. Hartley assumes that the earnings will continue to increase at the same rate. How much will the business earn on day 10?

$
Stuff to Teach

- How can you teach students to organize the information provided in the problem?
- Once they've organized the information, how do you teach them to determine what's next?
- What can you use to make the necessary process(es) visible to your students?

Reading and Reasoning Process

First Read: Read for Understanding

Second Read: Identify a Problem-Solving Process

Third Read: Solve the Problem and Check for Reasonableness

Miller, P. and Koesling, D. *Mathematics Teaching for Understanding: Reasoning, Reading, and Formative Assessment.* Danvers, MA
Your Turn

Where else could you use sequencing skills in Mathematical Reasoning?

Other Applications for Sequencing Skills

Beyond Content . . . How About Test Strategies for Test Day?
Sequencing Skills Can Help on Test Day

Teach students to manage stress by having solid content knowledge and by approaching test-taking with a strategy.

- Students should answer all the questions that they know first and flag those that need more attention.
- Then, review the flagged questions to identify which ones they may have missed on the first round that they actually know how to answer.
- Last, take a shot at the questions that seem difficult—after all there is no penalty for guessing.

After the Webinar . . .

After looking at the RLA HII for sequencing and the related indicators for Social Studies, Science, and Math, take time to reflect on the following:

- What are the skills that need to be taught?
- How do you currently teach these skills?
- Focusing on your own experience, in what academic area do you usually teach sequential order?
- How could you transfer your lessons/strategies to the other academic areas?
Resources

www.GEDtestingservice.com
Determining What Comes Next
Thank you!

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