**Determining What Comes Next:
Focusing on Sequencing Skills**

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The PD Team

- Daphne Atkinson, GED Testing Service

- Debi Faucette, GED Testing Service

- Bonnie Goonen, Consultant to GEDTS

- Susan Pittman, Consultant to GEDTS

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

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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

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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

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With HIIs, 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

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Determining What Comes Next

Sequencing Across All Content Areas

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Your Turn . . .

Where do **YOU** use sequencing skills?

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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
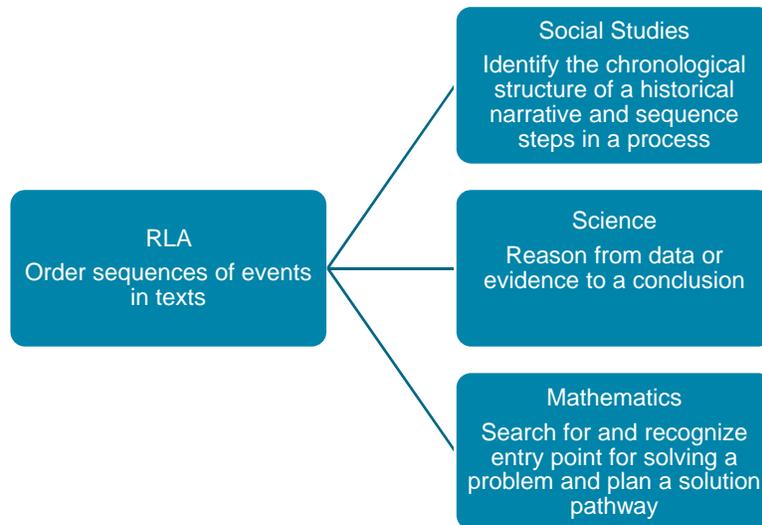
What Sequencing Does . . .

- 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

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Let's Go Deeper: RLA

Indicator	What to look for in student work. The student can:
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.

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Reasoning through Language Arts

RLA - Candidate Name

Question 6 of 12

Answer Explanation

Flag for Review

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Excerpt from *Anne of Green Gables*
by L. M. Montgomery

1   Marilla came briskly forward as Matthew opened the door. But when her eyes fell on the odd little figure in the stiff, ugly dress, with the long braids of red hair and the eager, luminous eyes, she stopped short in amazement.

2   "Matthew Cuthbert, who's that?" she exclaimed. "Where is the boy?"

3   "There wasn't any boy," said Matthew wretchedly. "There was only *her*."

Order of Events

Marilla tells Anne not to cry.	Matthew explains Anne's presence.
Anne tells why she prefers a different name.	Marilla decides Anne can stay for the night.

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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)

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Two Questions Close Readers Ask . . .

What happens in the text? → How does this part relate to what happens before and after?

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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.

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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.

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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.

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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.

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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

Indicator	What to look for in student work. The student can:
SSP.3 a. Identify the **chronological structure** of a historical narrative and sequence steps in a process.	• 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.
SSP.3.c: Analyze **cause-and-effect relationships and multiple causation**, including action by individuals, natural and societal processes, and the influence of ideas.	• 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.

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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)

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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)

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

Institution	Rank	Holdings
Harvard University	1	13,369,855
U. of Connecticut	50	2,626,06
Mass. Institute Tech.	73	2,448,647
Syracuse University	81	2,392,147

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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

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Primary Source Analysis Tool

QUESTION
What else do you wonder about it?
Who? What? Where? When? Why? How?

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

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A Few Social Studies Graphic Organizers

cycle 6 parts

timeline

1 cause/1 effect

1 cause/3 effects

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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.

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Your Turn

Where else could you use sequencing skills in Social Studies?

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Sequencing in Science

Implementing the Process in the Classroom

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Indicator for Science

Indicator	What to look for in student work. The student can:
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.

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Science Example

☑ Answer Explanation △ Flag for Review

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.

Net Force (N)	Mass (kg)	Acceleration (m/s²)
8	2	4
8	4	2
16	2	8
16	4	4

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.

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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)

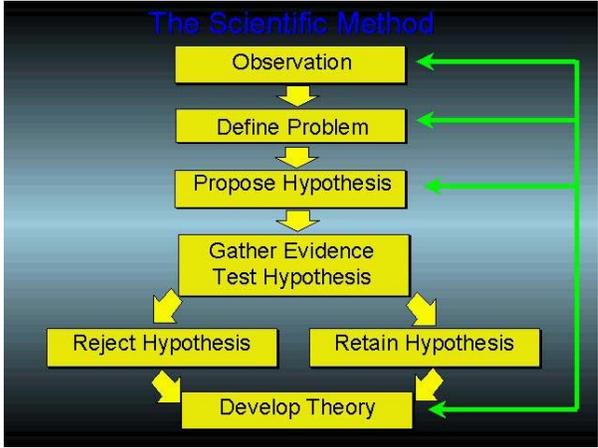40 GEDtestingservice.com • GED.com

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!

The Scientific Method

Observation

Define Problem

Propose Hypothesis

Gather Evidence Test Hypothesis

Reject Hypothesis   Retain Hypothesis

Develop Theory

Scientific Method + Sequencing + Real World

Observation and Problem	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.
Hypothesis	If I use Route X, I will arrive at work more quickly.
Gather Evidence and Test the Hypothesis	I drive to work the same time each day at the same speed taking a variety of routes, including Route X.
Analyze Results	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.
Draw Conclusion	Route X is the best route. However, I may want to test my hypothesis when driving home as traffic patterns may change.

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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.

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Your Turn

Where else could you use sequencing skills in Science?

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Sequencing in Mathematical Reasoning

Implementing the Process in the Classroom

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Indicator for Math

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

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A Math Example

Mathematical Reasoning – Candidate Name | Question 7 of 16

☑ Answer Explanation   ⏱ Calculator   ⚐ Flag for Review

🖩 Formula Sheet   🖩 Calculator Reference

Type your answer in the box. You may use numbers, a decimal point (.), and/or a negative sign (-) in your answer.

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 $367. Hartley assumes that the earnings will continue to increase at the same rate. How much will the business earn on day 10?

$ [   ]

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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)

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What Students Need . . .

Build their reading skills

Formula Sheet

Calculator Reference

Type your answer in the box. You may use numbers, a decimal point (.), and/or a negative sign (-) in your answer.

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 $367. Hartley assumes that the earnings will continue to increase at the same rate. How much will the business earn on day 10?

$ ____

Build math vocabulary

Depend less on rote memory

Implement the correct procedure

Increase conceptual knowledge

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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?

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Reading and Reasoning <u>Process</u>

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
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Your Turn

Where else could you use sequencing skills in Mathematical Reasoning?

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Other Applications for Sequencing Skills

Beyond Content . . . How About Test Strategies for Test Day?

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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.

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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?
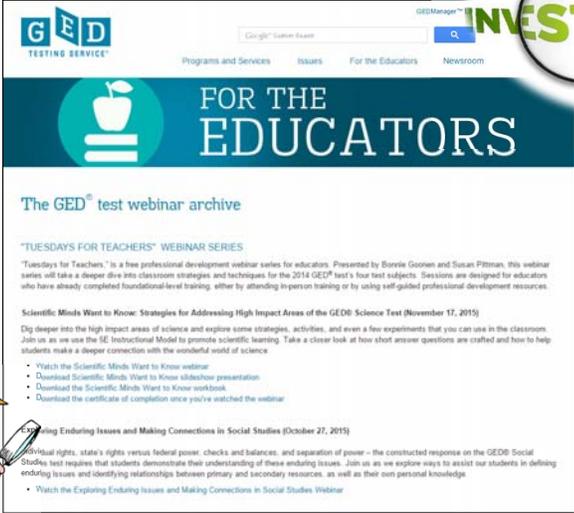
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Thank you!

Daphne Atkinson

daphne.atkinson@gedtestingservice.com

Debi Faucette

debi.faucette@gedtestingservice.com

Communicate with GEDTS

communications@GEDTestingService.com

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