Score Report Insights to Drive Instruction, Part 2: Focus on Mathematical Reasoning and Science

Daphne Atkinson, July 2018

Welcome
Session Objectives

• Analyze real GED Ready® and Operational GED® Test Score Reports
• Discuss the why and how of using score reports (as prescriptions) to drive instruction
• Share ideas and resources

How Do YOU Use Score Reports?
Common Score Report Uses

• Look at the score only…to gauge how far from 145 the score is
• Get a feel for what work needs to be done (in terms of skills and content)
• Compare the GED Ready and GED operational test scores for similarities and differences
• Don’t really use the score report—consider the feedback too “generic”

So How You Take It From This . . .

There’s nothing worse than when a test-taker doesn’t pass the test…especially after multiple tries!
To This…

How? Take Action!

- Review
- Diagnose
- Prescribe
Features of the Enhanced Score Report

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>GED® TEST</th>
<th>GED READY® PRACTICE TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Score</td>
<td>Indicates if a test-taker passed, passed with honors, or scored below passing.</td>
<td>Indicates if a test-taker is likely to pass, too close to call, or not likely to pass the GED® test.</td>
</tr>
<tr>
<td>How I Can Score Higher</td>
<td>Shows the skills a test-taker needs to work on before trying again. Includes a personalized study plan with pages and chapters to review in popular study materials.</td>
<td>Shows the skills a test-taker needs to work on before taking the GED® test. Includes a personalized study plan with pages and chapters to review in popular study materials.</td>
</tr>
<tr>
<td>What My Score Means</td>
<td>Explains what skills the student successfully demonstrated on the GED® test.</td>
<td>Explains what skills the student successfully demonstrated on the GED Ready® practice test.</td>
</tr>
<tr>
<td>Review My Written Answers</td>
<td>Available for the RLA test subject. Shows the students’ scores for their responses and the skills they need to work on to score higher. Not available for Science, Social Studies, or Math subjects.</td>
<td>Displays the test-taker’s written responses to extended response and short answer items. Educators can use the constructed response scoring tools to give test-takers feedback on their responses.</td>
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</tbody>
</table>

What Instructors Need to Know

Resources for Success
A GED Ready® Score Report: Yellow Zone

GED Ready® - Mathematical Reasoning

My Score: 136
TOO CLOSE TO CALL
Test Date: 01/25/2018

How I Can Score Higher

<table>
<thead>
<tr>
<th>Basic Math</th>
<th>Publisher Study Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill You Can Improve</td>
<td></td>
</tr>
<tr>
<td>- Find the distance between numbers on a number line using absolute value</td>
<td>Select your study material from the dropdown above to get study recommendations</td>
</tr>
<tr>
<td>- Create and solve problems with whole numbers, fractions, and decimals</td>
<td></td>
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<table>
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<tr>
<th>Geometry</th>
<th>Publisher Study Recommendations</th>
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<td>Skill You Can Improve</td>
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</tbody>
</table>

1/20/2019

Skill You Can Improve | Publisher Study Recommendations
---|---
- Construct, and explain data from bar graphs, circle graphs, dot plots, histograms, box plots, tables, scatter plots, and line graphs | |
- Find the volume and surface area of three-dimensional shapes (Examples: rectangular and right prisms, cylinders, right pyramids). Find the side lengths, radius, or diameter of a three-dimensional figure when given the volume or surface area | |
- Find the probability of one or more events happening | |
- Find the side lengths of triangles, rectangles, and polygons when given the area or perimeter | |

Basic Algebra

Skill You Can Improve | Publisher Study Recommendations
---|---
- Solve inequalities and real-world problems that involve them, and graph the solutions | |
- Add, subtract, multiply, divide, and factor polynomials (Example: \( x^2 + 8 \div (x + 4) \), factor \( 3x^4 + 10x^2 \)) | |
- Create algebraic expressions to represent problem situations or word-to-symbol translations (Example: write an inequality to match a word problem) | |

Graphs and Functions

Skill You Can Improve | Publisher Study Recommendations
---|---

The GED Ready® Math Score: 136
Areas for Improvement (a sample)

- Basic Math (e.g. Number lines and problem solving with whole numbers, fractions, and decimals)

- Geometry (e.g. construct and interpret data from various types of graphs; volume and surface area of three dimensional figures; find side lengths, radius or diameter when given the volume or surface area; basic probability; finding side lengths when given area or perimeter)

- Basic Algebra (e.g. multiplying polynomials; solve inequalities; and create basic algebraic expressions to solve problems)

- Graphs and functions
What About the Additional Skills?

• These represent skills that the test-taker was NOT consistent with:
  • Solve problems involving rational numbers
  • Compute unit rates
  • Solve two-step, arithmetic, real world problems that involve percents
  • Compute the area and perimeter of triangles and rectangles
  • Find side lengths of triangles and rectangles, when given area or perimeter
  • Calculate the mean, median, mode, range, and weighted average, and calculate a missing data value, given the average and all the missing data values but one

Diagnosis

• An “incidental” math student whose math reasoning abilities stalled after learning the basics.
• Use the Performance Level Descriptors (PLDs) to determine where the student is on the math continuum—as you already know, you can’t add the more complex topics until the foundation is in place.
• Students who are confused by a number line, more likely than not, are not going to be able to plot points on a coordinate plane.
• As you determine how to sequence math content, keep in mind what foundational skills are necessary.
But…the Feedback Doesn’t Cover What Specific Questions Were Missed

• No, the feedback summarizes the skills that are needed to earn a higher score
• And yes, we are inferring what’s needed based on what was not demonstrated (and here we are talking about consistency)

Ideally, What Happens Next?

How do we get the biggest bang for the buck with the available time?
• High Impact Indicators (HIIs)
• Performance Level Descriptors (PLDs for Level 1 - Not Passing and Level 2 – High School Equivalency)
• And, remember to have students review the Study Guide
How to Use PLDs in the Classroom

Use PLDs to:

Tip 1: Assess student’s current skill level
Tip 2: Determine when students are ready to test
Tip 3: Shape learning activities
Tip 4: Add perspective to lesson plans

Mathematical Reasoning

Mathematical reasoning is the critical skill that enables a student to make use of all other mathematical skills. With the development of mathematical reasoning, students recognize that mathematics makes sense and can be understood.
Analysis of Math Challenges

In Mathematical Reasoning, items require:
- Application and development of quantitative and algebraic reasoning skills
  - Grounded in real-world examples
  - Beyond rote application of formulas and/or procedural steps
  - The “why” and “how” of math
- Strong critical reading and thinking skills
  - What is the question asking?
  - What heuristics can I use?
  - Is the answer reasonable?
## Productive vs. Non-Productive Beliefs

<table>
<thead>
<tr>
<th>Unproductive Beliefs</th>
<th>Productive Beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students can learn to apply mathematics only after they have mastered the basic skills.</td>
<td>Students can learn mathematics through exploring and solving contextual and mathematical problems.</td>
</tr>
<tr>
<td>The role of the student is to memorize information that is presented and then use it to solve routine problems on homework, quizzes, and tests.</td>
<td>The role of the student is to be actively involved in making sense of mathematics tasks by using varied strategies and representations, justifying solutions, making connections to prior knowledge or familiar contexts and experiences, and considering the reasoning of others.</td>
</tr>
<tr>
<td>An effective teacher makes the mathematics easy for students by guiding them step by step through problem solving to ensure that they are not frustrated or confused.</td>
<td>An effective teacher provides students with appropriate challenges, encourages perseverance in solving problems, and supports productive struggle in learning mathematics.</td>
</tr>
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Just a Couple of Strategies for the Classroom

• Teach a simple approach to solving word problems by using real world examples
• Teach multiple ways to solve problems
• Focus on the WHY to give reasoning skills a boost
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

And What About Our “Too Close to Call” Test-Taker?

- The Math test score was 135—completely in line with the feedback from the GED Ready® exam
- The operational exam feedback identified overlapped with the areas needing improvement on the GED Ready®—Basic Math, Geometry, Basic Algebra, Graphs & Functions…
- Sound familiar?
What Instructors Need to Know: Science

Same Skills...Different Context

Overview of Science Test

- **Content**
  - Life Science – 40%
  - Physical Science – 40%
  - Earth and Space Science – 20%

- **Themes**
  - Human Health and Living Systems
  - Energy and Related Systems

- **Science Practices** – reasoning and thinking scientifically
- **Question types** – Technology-enhanced items
### My Score: 141

**Test Date:** 04/12/2018

### How I Can Score Higher

#### Reading for Meaning in Science

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<tr>
<th>Skill You Can Improve</th>
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<tr>
<td>Understand symbols, terms, and phrases in science</td>
<td>Select your study material from the dropdown above to get study recommendations</td>
</tr>
<tr>
<td>Understand and explain information from science readings</td>
<td></td>
</tr>
</tbody>
</table>

#### Designing and Interpreting Science Experiments

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<tr>
<td>Understand and apply science theories and processes</td>
<td></td>
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</table>

#### Using Numbers and Graphics in Science

<table>
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</thead>
<tbody>
<tr>
<td>Decide whether conclusions are supported by data</td>
<td></td>
</tr>
<tr>
<td>Make predictions based on data</td>
<td></td>
</tr>
<tr>
<td>Identify and improve hypotheses for scientific investigations</td>
<td></td>
</tr>
<tr>
<td>Use numbers or symbols to display science information (Examples: use chemical symbols for elements or provide a numeric answer from interpreting a graph or chart)</td>
<td></td>
</tr>
<tr>
<td>Apply science formulas (Example: s = d/t)</td>
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</tr>
<tr>
<td>Explain different ways in which scientific information is presented (Examples: tables, charts, diagrams)</td>
<td></td>
</tr>
</tbody>
</table>
Additional Skills (Selected)

- Identify and refine hypotheses for scientific investigations
- Pull specific evidence from a written source to support a finding or conclusion
- Make a prediction based on data or evidence
- Make judgments about whether theories or conclusions are supported or challenged by data or evidence
- Express scientific information or findings using numbers or symbols
- Understand and explain written scientific presentations

GED Ready® Science Score: 141
Areas for Improvement

- Reading for Meaning in Science
- Designing and Interpreting Science Experiments
- Using Numbers and Graphics in Science
Diagnosis

- Transform into a proficient reader—being able to sort through the structure of text to extract important details, evidence, and facts
- Develop close reading skills (an essential)
- Practice engaging with Science texts (noticing, wondering, questioning, relating, thinking, and on occasion, arguing)
- Practice “reading between the lines” (aka inference)

Explore the Relationships

R.8.6: Identify an underlying premise or assumption in an argument and evaluate the logical support and evidence provided. Primarily measured with informational texts.

SSP.1 a. Determine the details of what is explicitly stated in primary and secondary sources and make logical inferences or valid claims based on evidence.

AS.1.a: Cite specific textual evidence to support inferences, conclusions, or analyses of technical texts.
How Did Our Test-Taker Fare with Operational Testing?

• GED® Science test score: 143
• The operational exam feedback identified the following areas as needing improvement
  
  • Reading for Meaning in Science
  • Designing and Interpreting Science Experiments
  • Using Numbers and Graphics in Science

• Sound familiar? It should…the same feedback from the GED Ready®!

Questions for Reflection

What Can YOU Take Away from this Session?
Questions to Ask Yourself…and Your Colleagues

• What are the key ingredients in skill development?
• What are some of the most effective ways to prompt persistence especially in students who struggle with reading, writing, or mathematical reasoning?
• How can I bring these elements to the classroom?

A Few Takeaways…
Key Takeaways

• One size doesn't fit all…and probably won't even fit most.
• Please unlearn the notion that there is ONLY one right way—whether it is writing, problem-solving, or thinking critically.
• Once is not enough—if that were true, we would have legions of experts!
• Flow with the plateaus—learning and skill development are not linear.
• Remember that *learning* is both iterative and integrative. This will enable you to expect the best and have your students deliver their best.

"Expect everything and attach to nothing."

— Carrie Campbell
https://ged.com

Welcome to the home of the official GED® test. Find everything you need to earn your high school equivalency diploma right here.

Questions?
Thank you!

Communicate with GED Testing Service®
communications@ged.com