North Carolina Mathematics Standard Setting

Grades 3–8, Math 1, and Math 3

Bookmark Training Session
July 9, 2019
Training Session

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Data Recognition Corporation
Workshop Goal

• To recommend cut scores that categorize students into one of four achievement levels:
  – Level 2 & Below
  – Level 3
  – Level 4
  – Level 5
Three cut scores classify students into four achievement levels.
Bookmark Procedure

- Item-centered method
- Content-based decisions
- Iterative process
Process Overview

**Today**
- Discuss the threshold students for grade 4, grade 7, or Math 1
- Study the ordered item booklet
- **Round 1**: Make cut score recommendations on your own

**Tomorrow and Thursday**
- **Round 1**: Make cut score recommendations on your own
- Discuss recommendations with your table
- **Round 2**: Make cut score recommendations on your own
- Discuss your recommendations with your group
- **Round 3**: Make cut score recommendations on your own
- Repeat the process for remaining grades
- Review the group’s recommendations
- Evaluate the workshop
Achievement Level Descriptors (ALDs)

- ALDs describe the knowledge, skills, and abilities expected of students in each achievement level.
  - They are linked to the content standards.
  - ALDs describe students in the middle of each level, not on the thresholds.
ALDs and Achievement Levels

- ALDs describe the student in the middle of each achievement level.
Three Threshold Students

• Threshold students are those just barely leaving one level and entering the next level.
  – The ALDs do *not* describe these students directly.
  – There are three threshold students.
Ordered Item Booklet (OIB)

• The OIB comprises items from the spring test.
  – One item per page
  – Easiest item first
  – Hardest item last
  – Items ascend in difficulty as based on student performance
Three Threshold Students

• Bookmark judgments and cut scores are linked to the student *just* in each level.
Threshold Students and the OIB

- You will consider the three threshold students.
- You will make statements in the OIB using *bookmarks*.
- These bookmarks are linked to cut score recommendations.

Example: The student who is just in Level 4 will likely have the knowledge and skills measured by the items on pages 1–4 of the OIB.
Three Rounds

Round 1
- Study OIB and make your own bookmark judgments
- Discuss your ratings with your tablemates

Round 2
- On your own, make your own bookmark judgments
- See feedback and discuss your ratings with your group

Round 3
- On your own, make your own bookmark judgments
- Then review recommended cut scores
Roles and Responsibilities

• You will recommend achievement standards to DPI.
• During the workshop, remember to:
  – Contribute to discussions at your table
  – Participate in group-wide discussions
  – Place your bookmarks independently
  – Ask a member of staff any questions
  – Use workshop materials only in meeting rooms
  – Keep workshop conversations confidential
Workshop Security

- Your facilitators will collect your materials each afternoon in a structured way.
- Always leave the workshop materials in the meeting rooms. Do not discuss the contents of the materials outside your meeting room.
- You are welcome to use phones, tablets, and laptops in the lunchroom and hallways, but never in the meeting rooms.
Training Materials

• Item map
• Training ordered item booklet (OIB)
### Training Item Map for Grade 6 Math

<table>
<thead>
<tr>
<th>Order of Difficulty</th>
<th>Standard</th>
<th>Score Key</th>
<th>What does this item or score point measure? What do you know about a student who can answer this item or score point correctly?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC.6.RP.4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NC.6.EE.9</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>NC.6.NS.7.a</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>NC.6.EE.8</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>NC.6.EE.1</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>
Examining an Item

- Make a brief note to yourself about what the item measures.
  - What knowledge and skills does a student need to have in order to answer the item correctly?
  - If a student answers the item correctly, what do you know about the student?
Finding a Possible Bookmark Range

• You will consider the three threshold students.
• You will make statements in the OIB using bookmarks.
• These bookmarks are linked to cut score recommendations.

Example: The student who is just in Level 4 will likely have the knowledge and skills measured by the items on pages 1–4 of the OIB.
Possible Bookmark Range

• You will find a range of items where you could set your bookmark.
  – The possible bookmark range may be a couple of items wide, or may be more than that.
  – Do not get stuck on a single item.
Finding the Possible Bookmark Range

• Progress through the OIB until you reach an item that the threshold student would not have a more-likely-than-not chance of answering correctly.
  – This is the start of your possible bookmark range.

• Keep going until you have reached the last item that a student would have a more-likely-than-not chance of answering correctly.
  – The possible bookmark range ends after that page.
The threshold *Level 4* student is not expected to have command of the skills measured by items after the bookmark.

The threshold *Level 4* student is expected to have command of the content measured by the items before the bookmark.

Some students in *Level 4* may have some of the skills measured by items after the bookmark.

The threshold *Level 4* student is expected to have a more-likely-than-not chance of answering these items correctly.
Recording Your Bookmark

• Place your bookmark within your possible bookmark range.
  – Use the ALDs, the threshold students, the test items, and your professional judgment as guides.

• Record the page number after your bookmark.
• Write your bookmarks on the *Bookmark Worksheet*.
  – You will place three bookmarks.
  – Write a few words to help you remember why you placed your bookmarks where you did.
Recording Your Bookmarks

• In the actual workshop, you will then record your bookmarks in an online system.
  – You will record your bookmarks online, *not* your rationales.
Pacing

• Some people will take longer than others to study the test items and place their Round 1 bookmarks.
  – Today, completing Round 1 is the last activity for the day. Please be considerate of others as you leave the workshop.
  – Tomorrow, before Round 2, please be considerate of others at your table and in the room.
Consider the Threshold Student

• Review these policy ALDs for Level 4 and Level 5.
  – Consider the student who is just barely in Level 4.
  – What knowledge, skills, and abilities would you expect of this threshold student?

<table>
<thead>
<tr>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students at Level 4 demonstrate a thorough understanding of grade level content standards and are on track for career and college.</td>
<td>Students at Level 5 demonstrate comprehensive understanding of grade level content standards, are on track for career and college, and are prepared for advanced content at the next grade/course.</td>
</tr>
</tbody>
</table>
Study the Test Items

• For each question, ask yourself:
  – what does the item measure?
  – if a student can answer the item correctly, what do we know he or she can do?
Consider the *Level 4* threshold student.

The student is expected to have at least a more-likely-than-not chance of answering items correctly before the bookmark.

The probability after the bookmark is less than half, but not zero.
Evaluating a Bookmark Holistically

Imagine you are evaluating a Level 4 bookmark on Page 5.

Does the content measured by the items before the bookmark best match the content you expect of the just Level 4 student?
Write a Rationale

• Good rationales link the content of the items in front of the bookmark to the content-based expectations for the threshold student.
  – For example, “Students must apply algebraic strategies in a real-world, multi-step problem, as expected of the threshold student.”
  – Or, “Students have to calculate simple descriptives on data provided explicitly, as listed in ALDs.”

• Not-so-good rationales don’t make reference to the content of the items.
  – For example, “The first grid question is just after the bookmark.”
Make Your Bookmark Placements

- Write your bookmark placement on your training Bookmark Worksheet.
- Turn your Worksheet over when you’re done.
After Round 1

- After Round 1, you will see:
  - the medians from the group’s Round 1 bookmarks
  - a histogram of the recommended bookmarks
  - benchmarks, based on last year’s test results

- The benchmarks are provided as contextual information for you to consider.
Discussion of Round 1 Ratings

- In the actual workshop, you will discuss your Round 1 bookmarks at your table.

- Feel free to discuss:
  - Your bookmarks
  - Your possible bookmark ranges (and any overlaps)

- After discussion, you will have a second opportunity to make bookmark judgments.
  - You can change any, all, or none of your bookmarks.
  - Bookmark placement is always an individual activity.
Suggestions for Discussions

• Practice active listening.
• Be open to changing your mind.
• Work to understand your colleagues’ rationales for their bookmark placements.
• In a respectful manner, feel free to ask questions of your colleagues.
• Do not discuss your bookmarks until everyone at the table has placed theirs.
• Keep the contents of your discussions private.
After Round 2

- After Round 2, you will see:
  - the medians and histogram from the group’s Round 2 bookmarks
  - *benchmarks*, based on last year’s test results
  - *impact data*, the percent of students that would be classified in each achievement level if the Round 2 cut scores were implemented
Round 3

• After Round 2, you will discuss your bookmark placements across tables.
  – Again, you will share where you placed your bookmarks and why you placed them there.

• Then you will place your Round 3 bookmarks.
  – Bookmark placement is always an individual activity.
Repeat the Process

• After Round 3, you will see the impact data for your grade plus the other grades.
• Then you will repeat the process.
  – The group will likely pick up speed as it goes.

<table>
<thead>
<tr>
<th>Grades 3-5 Group</th>
<th>Grades 6-8 Group</th>
<th>High School Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 4</td>
<td>Grade 7</td>
<td>Math 1</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Grade 6</td>
<td>Math 3</td>
</tr>
<tr>
<td>Grade 5</td>
<td>Grade 8</td>
<td></td>
</tr>
</tbody>
</table>
Reviewing the Recommendations

- After the Bookmark Procedure is complete for the final grade, your facilitator will show you a presentation of the Round 3 recommendations from all eight tests.
  - You will be asked to look at the articulation of the achievement standards across grades.
  - You may wish to consider adjustments to your recommendations to improve the articulation across grades.
  - The table leaders will convene in a special session to look over the recommendations and, if needed, recommend adjustments to promote better across-grade articulation.
After the Workshop

• Your recommendations will be considered by DPI.
  – The recommendations from all groups will be considered by DPI and its advisors.
Workshop Structure

- Discuss threshold students
- Study OIB and make Round 1 ratings
- Discuss Round 1 at tables
- Make Round 2 ratings
- Discuss Round 2 as a group
- Make Round 3 ratings
- Repeat the process for remaining grades
- Review recommendations
Questions

• Do you have any questions?
  – If questions come up later, ask your facilitator, or write them on an index card.
Cut Scores & Achievement Levels

• Three cut scores classify students into four achievement levels.
Three Threshold Students

• Bookmark judgments and cut scores are linked to the student *just* in each level.
You will consider the three threshold students.
You will make statements in the OIB using bookmarks.
These bookmarks are linked to cut score recommendations.

Example: The student who is just in Level 4 will likely have the knowledge and skills measured by the items on pages 1–4 of the OIB.
Possible Bookmark Range

- You will find a range of items where you could set your bookmark.
  - The possible bookmark range may be a couple of items wide, or may be more than that.
  - Do not get stuck on a single item.
Finding the Possible Bookmark Range

• Progress through the OIB until you reach an item that the threshold student would not have a more-likely-than-not chance of answering correctly.
  – This is the start of your possible bookmark range.

• Keep going until you have reached the last item that a student would have a more-likely-than-not chance of answering correctly.
  – The possible bookmark range ends after that page.
The threshold Level 4 student is expected to have a more-likely-than-not chance of answering these items correctly.

Some students in Level 4 may have some of the skills measured by items after the bookmark.

The threshold Level 4 student is not expected to have command of the skills measured by items after the bookmark.

The threshold Level 4 student is expected to have command of the content measured by the items before the bookmark.

Ordered Item Booklet
Recording Your Bookmark

• Place your bookmark within your possible bookmark range.
  – Use the ALDs, the benchmarks, and your professional judgment as guides.
• Record the page number **after** your bookmark.
**Bookmark Worksheet**

- Write your bookmarks on the *Bookmark Worksheet*.
  - You will place three bookmarks.
  - Write a few words to help you remember why you placed your bookmarks where you did.
Not “Number Correct”

• Your bookmark placement does not correspond directly with the number of points a student needs to earn to be classified in an achievement level.
  – For example, if you place your Level 4 bookmark on Page 10, this does not mean a student needs to get 10 points on the test to be in Level 4.

• Instead, your cut score recommendations are made on the test scale.
Test Scale

- Items are ordered by difficulty, easy to hard.
- Students are ordered by performance, low to high.
The bookmark separates items.
The cut score separates students.
The threshold student has a 50% chance of answering the item just before the bookmark.
• Consider the *Level 4* threshold student.
• The student is expected to have at least a more-likely-than-not chance of answering items correctly before the bookmark.
• The probability after the bookmark is less than half, but not zero.
Evaluating a Bookmark Holistically

Imagine you are evaluating a Level 4 bookmark on Page 5.

Ordered Item Booklet

Does the content measured by the items before the bookmark best match the content you expect of the just Level 4 student?
If the Level 4 bookmark is on Page 5, the threshold Level 4 student will show command of the content measured by the items on Pages 1 through _____.

Ordered Item Booklet

Item 2 is _____ than Item 7.
   a) Easier
   b) Harder
The threshold Level 4 student would have a _____ chance of answering Items 1–2 correctly.

a) More likely than not
b) Nearly 100% chance
Write a Rationale

• Good rationales link the content of the items in front of the bookmark to the content-based expectations for the threshold student.
  – For example, “Students must apply algebraic strategies in a real-world, multi-step problem, as expected of the threshold student.”
  – Or, “Students have to calculate simple descriptives on data provided explicitly, as listed in ALDs.”

• Not-so-good rationales don’t make reference to the content of the items.
  – For example, “The first grid question is just after the bookmark.”
Rounds

• **Round 1:** Place bookmarks on your own
• **Round 2:** See feedback and benchmarks, discuss with your tablemates, place bookmarks on your own
• **Round 3:** See feedback and impact, discuss with the group, place bookmarks on your own
Before we continue, let’s complete the mid-process evaluation.