Guidance for Indicator 1ai

Focus and Coherence: Full Intent of the Mathematical Content

Criterion: The instructional materials are coherent and consistent with “the high school standards that specify the mathematics which all students should study in order to be college and career ready” (p. 57 of CCSSM).

Indicator 1a: The materials focus on the high school standards.

i. The materials attend to the full intent of the mathematical content contained in the high school standards for all students.

Do the materials attend to the full intent of the non-plus high school standards? Does the evidence impact “Students won’t have enough time to fully learn the standard” (indicator 1bii) or “the content of the standard is not present” (indicator 1ai)?

Purpose of the Indicator:

This indicator, along with the other indicators of Gateway 1, determines the shifts of focus and coherence. This indicator attends to the shift of focus by specifically examining those standards which do not have a plus (+) symbol (non-plus standards), and in the case of non-plus standards labeled as opportunities for modeling, this indicator examines only the ***content*** of those non-plus standards. This indicator attends to the shift of coherence by analyzing non-plus standards across a high school series to determine if the materials limit the aspects (see below) of non-plus standards that are addressed.

Evidence Collection:

Review the HS CCSSM to become familiar with the non-plus standards and clusters.

For each course in the series, note what aspects of non-plus standards are addressed through any instructional materials provided, including assessments.

Aspects could include, but are not limited to:

- types of mathematical objects (equation, expression, inequality, systems);
- types of numbers;
- families of functions/equations/inequalities (polynomial, exponential, logarithmic, rational, etc.);
- tools used (paper and pencil, graphing calculators, software, etc.);
- actions required by the teacher (see **Notes** in Scoring section); and
- actions required of students (see **Notes** in Scoring section).

For the series, determine if each aspect of the non-plus standards is completely addressed through any instructional materials provided, including assessments.

(Continued)

For the series, note entire non-plus standards that are not addressed or aspects of non-plus standards that are not addressed.

- For example, if a series only offered opportunities with the cluster A-CED that involved mathematical objects from linear or quadratic families, then the series would not be attending to the full intent of the mathematical content contained in the cluster A-CED.
- For example, if a series allows opportunities regarding A-REI.11 for students to work solely with linear functions and not the other function types listed, then the series would not be attending to the full intent of the standard.
- For example, standard A-SSE.3 states “Choose and produce an equivalent form of an expression…” The series would not meet the full intent of the standard if students are required to produce equivalent forms without ever having a choice as to which equivalent form. That is, if students are always directed to produce a specific equivalent form (e.g. “Rewrite in factored form”) and they are never allowed choice (e.g. “Rewrite in an equivalent form that reveals the zeros of the function.”), then the series does not meet the full intent of the standard.

Discussion Points for Cluster Meeting:

Have all aspects of the non-plus standards been addressed through any instructional materials provided, including assessments, by the series?

If yes, be sure to have evidence of where various aspects of different standards are addressed.

If no, be sure to have evidence of which non-plus standards are omitted or which aspects of non-plus standards are not fully addressed.

Are there any courses in the series that excel in addressing this indicator?

Are there any courses in the series that do not address this indicator as well as the others?

Scoring:

Notes: The parts of the materials that teachers complete can be used as evidence of attending to the full intent of the standards for this indicator. If students do not have the opportunity to attend to standards, or aspects of them, independently but teachers do, then the materials would be attending to the full intent of the standards for this indicator but not giving students the opportunity to fully learn the standard, which is 1bii.

4 points:

- All aspects of all non-plus standards are addressed by the instructional materials of the series.

OR

- There are few instances where all aspects of the non-plus standards are not addressed by the instructional materials of the series.

2 points:

- More than a few aspects of the non-plus standards have not been completely addressed by the instructional materials of the series.

AND/OR

- Some non-plus standards have been entirely omitted from the instructional materials of the series.

0 points:

- Many aspects of the non-plus standards have not been completely addressed by the instructional materials of the series.

AND/OR

- Many non-plus standards have been entirely omitted from the instructional materials of the series.

Guidance for Indicator 1aii:

Focus and Coherence: Full Intent of the Modeling Process

Criterion: The instructional materials are coherent and consistent with "the high school standards that specify the mathematics which all students should study in order to be college and career ready" (p. 57 of CCSSM).

Indicator 1a: The materials focus on the high school standards.

ii. The materials attend to the full intent of the modeling process when applied to the modeling standards.

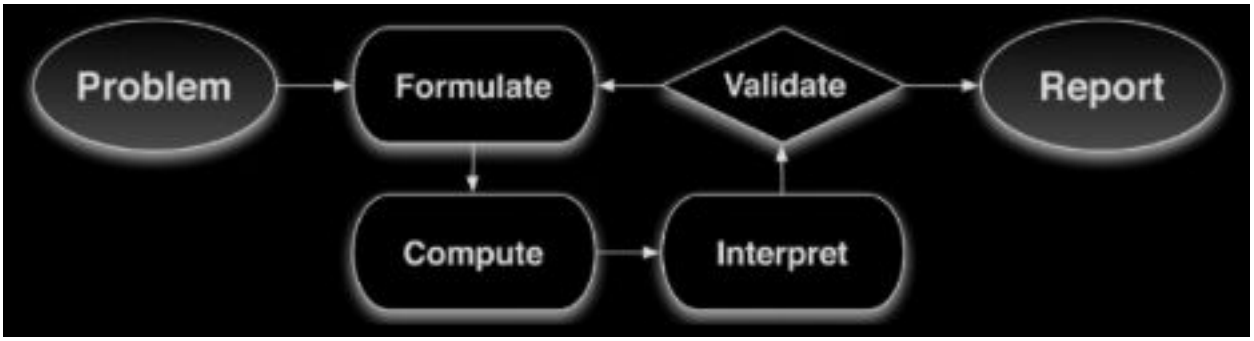
Do the instructional materials attend to the full intent of the <u>modeling process</u> when applied to the modeling standards?

<u>Purpose of the Indicator:</u>

This indicator, along with the other indicators of Gateway 1, determines the shifts of focus and coherence. This indicator attends to the shift of focus by specifically examining the use of the modeling process with those standards that have a star symbol but do not have a plus (+) symbol (modeling standards). This indicator attends to the shift of coherence by analyzing the use of the modeling process with the modeling standards across a high school series to determine if the materials limit any of the aspects (see below) of the standards in which the modeling process is used.

<u>Evidence Collection:</u>

Review the HS CCSSM description of modeling on pages 72-73.



Review the progressions document "Modeling, High School".

Review "How to Identify Tasks that Engage Students in Mathematical Modeling NCTM-SIAM Committee on Modeling Across the Curriculum".

(Continued)

For more information on the full intent of the modeling process, read “Math Modeling: Getting Started & Getting Solutions” (A link to this handbook cannot be provided, but it can be downloaded by googling “SIAM and Moody's modeling handbook”.)

Review the HS CCSSM to become familiar with the conceptual categories, modeling standards, domains, and clusters (notation and wording).

Review the tables of contents for both the student and teacher materials, any standards-alignment information in the materials, and any scope and sequence information provided by the publisher to gain a foundation of where and how often the modeling standards are addressed.

For each course in the series, note where modeling standards are being addressed with the full intent of the modeling process through any instructional materials provided, including assessments.

For each course in the series, note where aspects of modeling process are being addressed with the full attention to the modeling standards through any instructional materials provided, including assessments.

Aspects *could* include, but are not limited to:

- determination of important information;
- variable identification;
- approximation of quantities, shapes, behaviors, etc.;
- formulation of models (e.g. geometric, graphical, tabular, algebraic, statistical representations);
- analysis of relationships;
- consideration of underlying assumptions;
- interpretation of results in the context of the situation;
- validation of conclusions in light of the context;
- revision of models as needed;
- summarization of conclusions, assumptions, and methods; and
- tools used (paper and pencil, graphing calculators, software, etc.).

For the series, determine if all aspects of the modeling process are completely addressed with full attention to the modeling standards through any instructional materials provided, including assessments.

For the series, reviewers should note instances of descriptive modeling.

(Continued)

For the series, note aspects of modeling standards that are not addressed, especially in light of the modeling standards.

The following examples are non-conclusive guides for illustrative purpose only:

- If the materials regularly direct students to the choice of variables to be used, then the materials do not attend to the full intent of the modeling process.
- If the materials constantly give students the model to be used, then the materials do not attend to the full intent of the modeling process.
- If the materials dictate what conclusions should be made, then the materials do not attend to the full intent of the modeling process.
- If the materials do not allow for students to reflect on the appropriateness of results in light of the context and/or make adaptations to the model, then the materials do not attend to the full intent of the modeling process.

Discussion Points for Cluster Meeting:

Are individual aspects of the modeling process found in the materials? Do the materials focus on isolated aspects in order to build up to the fullness of the modeling process? If so, do the materials allow for multiple, culminating opportunities for students to employ the fullness of the modeling process?

If yes, document which aspects, or combination of aspects, of the modeling process are found. Provide evidence of how the materials allow students to grow in the modeling process.

If no, provide evidence for when different aspects of the modeling process are found in isolation.

Has the full intent of the modeling process through any instructional materials provided, including assessments, been addressed?

If yes, provide evidence of where the materials provide opportunities for students to employ the full modeling process.

If no, provide evidence of where the materials interrupt the modeling cycle. Specify which aspects of the modeling process are addressed and which aspects are neglected.

Are there any modeling standards, clusters, domains, or conceptual categories that are addressed without consideration of the full intent of the modeling process?

Do the materials allow for growth and sophistication with modeling as specified in the progression documents?

Scoring:

2 points:
● The full intent of the modeling process is used to address all, or nearly all, of the modeling standards by the instructional materials of the series.

OR

● The instructional materials intentionally develop the full intent of the modeling process throughout the series leading to culminating experiences that address all, or nearly all, of the modeling standards.

1 point:
● Various aspects of the modeling process are present in isolation or combinations, yet opportunities for the complete modeling process are absent for the modeling standards throughout the instructional materials of the series.

AND/OR

● The full intent of the modeling process has not been used to address more than a few modeling standards by the instructional materials of the series.

AND/OR

● The full intent of the modeling process has been omitted for more than a few modeling standards by the instructional materials of the series.

0 points:
● Some aspects of the modeling process are altogether missing from the instructional materials of the series.

AND/OR

● The full intent of the modeling process has not been used to address many of the modeling standards by the instructional materials of the series.

AND/OR

● The full intent of the modeling process has been omitted for most of the modeling standards by the instructional materials of the series.

Guidance for Indicator 1bi:

Focus and Coherence: Widely Applicable as Prerequisites

Criterion: The instructional materials are coherent and consistent with “the high school standards that specify the mathematics which all students should study in order to be college and career ready” (p. 57 of CCSSM).

Indicator 1b: The materials provide students with opportunities to work with all high school standards and do not distract students with prerequisite or additional topics.

> i.The materials, when used as designed, allow students to spend the majority of their time on the content from CCSSM widely applicable as prerequisites for a range of college majors, postsecondary programs, and careers.

Do the materials, when used as designed, focus on the Widely Applicable Prerequisites (WAPs) for a range of college majors, postsecondary programs, and careers?

Purpose of the Indicator:

This indicator, along with the other indicators of Gateway 1, determines the shifts of focus and coherence. This indicator attends to the shift of focus by specifically examining if a majority of the instructional materials are designed to engage students in content from the CCSSM widely applicable as prerequisites for a range of college majors, postsecondary programs, and careers. This indicator attends to the shift of coherence because much of the content from the CCSSM widely applicable as prerequisites for opportunities after high school not only spans multiple courses at the high school level but also incorporates the application of key takeaways from grades 6 through 8.

Evidence Collection:

Review Table 1 on page 8 of High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013) to become familiar with the content from the CCSSM widely applicable as prerequisites for a range of college majors, postsecondary programs, and careers (WAPs).

Review the tables of contents for both the student and teacher editions, any standards-alignment information in the materials, and any scope and sequence information provided by the publisher to gain a foundation of where and how often the WAPs are addressed.

Review chapters, lessons, activities, and assessments throughout the series to verify any standards-alignment information in the materials or given by the publishers.

(Continued)

Review any information in the materials or given by the publishers that discuss the allocation of time to the WAPs.

For each course in the series, note how often the WAPs are addressed through any instructional materials provided, including assessments.

For each course in the series, document how often prerequisite or additional topics are included in a way that distracts students from the WAPs or all non-plus standards. When noting a distraction, reviewers should clearly describe how the prerequisite or additional topics are drawing students' learning away from the WAPs or all non-plus standards.

The following examples are non-conclusive guides for illustrative purpose only:

- In a first-year high school course, numerous activities, lessons, or chapters that merely review content standards from grades 6 through 8 could be distracting, prerequisite topics.
- A unit or chapter addressing the concept of limits and the skills associated with calculating limits could be a distracting additional topic.
- A unit on fractals or tessellations where the CCSSM are not intertwined would be considered an additional, distracting topic if the unit does not strengthen, support, or introduce CCSSM.

For the series, analyze how often the WAPs are addressed by the instructional materials, including assessments.

Analysis of how often the WAPs are addressed could include, but is not limited to:

- amount of instructional materials, including assessment items, aligned to the WAPs;
- amount of instructional materials, not including assessment items, aligned to the WAPs; and
- amount of instructional materials that include distracting prerequisite or additional topics.

Discussion Points for Cluster Meeting:

Do a majority of the materials in the series, when used as designed, engage students in the WAPs?

If yes, be able to clearly explain what evidence has been collected and how the evidence justifies your conclusion.

If no, be able to clearly justify with evidence how the materials fall short of having a majority. Evidence could include how the materials might be supplemented to achieve a majority.

Do the materials in the series, when used as designed, distract students with prerequisite or additional topics? In what ways might topics that align to standards from grades 6 through 8 or the plus standards not be considered distracting, prerequisite, or additional?

Scoring:

2 points:

- Evidence clearly describes how the materials for the ***SERIES***, when used as designed, allows students to spend the majority of their time (>50%) on the content widely applicable as prerequisites (WAPs) for a range of college majors, postsecondary programs, and careers.

OR

- The ***SERIES*** spends less than a majority of time on the content widely applicable as prerequisites for a range of college majors, postsecondary programs, and careers, and the majority of the rest of the materials addresses other non-plus standards.

1 point:

- The ***SERIES*** does not spend a majority of time on the WAPs, and some of the remaining materials address prerequisite or additional topics that are distracting.

0 points:

- The ***SERIES*** does not spend a majority of time on the WAPs, and the majority of the remaining materials address prerequisite or additional topics that are distracting.

Guidance for Indicator 1bii:

Focus and Coherence: Fully learn each standard

Criterion: The instructional materials are coherent and consistent with “the high school standards that specify the mathematics which all students should study in order to be college and career ready” (p. 57 of CCSSM).

Indicator 1b: The materials provide students with opportunities to work with all high school standards and do not distract students with prerequisite or additional topics.

> ii. The materials, when used as designed, allow students to fully learn each standard.

Do the materials, when used as designed, let students fully learn each non-plus standard?

Purpose of the Indicator:

This indicator, along with the other indicators of Gateway 1, determines the shifts of focus and coherence. This indicator attends to the shift of focus by examining the non-plus standards. This indicator attends to the shift of coherence by determining if the materials of a series, when used as designed, enable all students to fully learn every aspect of each non-plus standard.

Evidence Collection:

Review the HS CCSSM to become familiar with the non-plus standards and clusters.

Review the tables of contents for both the student and teacher editions, any standards-alignment information in the materials, and any scope and sequence information provided by the publisher to gain a foundation of where and how often the non-plus standards are addressed.

Review chapters, lessons, activities, and assessments throughout the series to verify any standards-alignment information in the materials or given by the publishers.

For each course in the series, reviewers should note what aspects, how often those aspects, and in what ways those aspects of non-plus standards are addressed through any instructional materials provided, including assessments.

Aspects could include, but are not limited to:

- types of mathematical objects (equation, expression, inequality);
- types of numbers;
- families of mathematical objects (polynomial, exponential, logarithmic, rational, etc.); and
- tools used (paper and pencil, graphing calculators, software, etc.).

(Continued)

For the series, reviewers should document when ***STUDENTS*** are provided with sufficient opportunities to fully learn a non-plus standard, paying careful attention to each aspect of the standard.

> For example, if students are given numerous opportunities to decide if two figures are similar by using the definition of similarity in terms of transformations, articulate the transformations required to show the similarity, and explain the meaning of similarity- all verified with formative assessments and given further opportunities if needed- then the materials allow students to fully learn standard G-SRT.2.

For the series, reviewers should document when aspects of non-plus standards are addressed on limited occasions through any instructional materials provided, including assessments.

> The following examples are non-conclusive guides for illustrative purpose only:
> - If the materials provide only one lesson where students see function notation, then the materials do not allow students to fully learn F-IF.2.
> - If students are required to explain each step in solving a simple equation only a couple times within the series, then the materials do not allow students to fully learn A-REI.1.
> - If students only calculate average rate of change of linear functions and all other aspects of F-IF.6 are addressed, then the materials do not allow students to fully learn F-IF.6.
> - If materials provide few exercises for students to practice a fluency standard, then the materials do not allow students to fully learn the standard.

For the series, reviewers should consider the variability of numbers, equation types, contexts, etc. that students will encounter while working with non-plus standards.

> The following examples are non-conclusive guides for illustrative purpose only:
> - If students solve systems of linear equations only with equations in slope-intercept form, then the materials do not allow students to fully learn A-REI.6.
> - If students only factor quadratics with a leading coefficient of 1, then the materials do not allow students to fully learn A-SSE.3 or A-APR.3.

For the series, reviewers should note where the materials employ formative assessments to help students and teachers know if students are ready to move on or if students require more work on non-plus standards. When this occurs, document how teachers and student will know what to do in order to fully learn non-plus standards.

Discussion Points for Cluster Meeting:

Do the materials, when used as designed, enable students to fully learn each non-plus standard?

If yes, be able to clearly describe the various ways in which the materials enable all students to learn all of the aspects of the non-plus standards.

If no, be able to clearly describe what characteristics the series is missing and how those characteristics would inhibit students from fully learning each non-plus standard.

If the series has not enabled all students to fully learn each non-plus standard, then what are the specific characteristics that the series is missing?

Would it be reasonable to believe students would have mastered the standards by the end of the series?

Scoring:

4 points:
Evidence clearly describes how the materials for the series, when used as designed, enable students to fully learn all or most of the non-plus standards.

2 points:
The materials for the series, when used as designed, do not enable students to fully learn some of the non-plus standards.

0 points:
The materials for the series, when used as designed, do not enable students to fully learn most of the non-plus standards.

Guidance for Indicator 1c:

Focus and Coherence: Sophistication Appropriate to High School

Criterion: The instructional materials are coherent and consistent with "the high school standards that specify the mathematics which all students should study in order to be college and career ready" (p. 57 of CCSSM).

Indicator 1c: The materials require students to engage in mathematics at a level of sophistication appropriate to high school.

Do materials engage students in mathematics at a level of sophistication appropriate for high school?

Purpose of the Indicator:

This indicator supports the shifts of Focus and Coherence. This indicator examines the materials to determine if students are given extensive opportunities to work with course-level problems and exercises appropriate to high school and relates new concepts to students' prior skills and knowledge.

Evidence Collection:

Review the units, chapters, lessons, and assessments in both student and teacher materials.

Review the far right column in Table 1 on page 8 of High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013) to become familiar with the application of key takeaways from Grades 6-8.

Throughout the series, look for age appropriate mathematical contexts. Scenarios should consist of real-life and relevant situations appropriate for high school students. Consider also that student interests can change as they progress through high school. Document instances of contexts that are or are not appropriate for high school students.

Throughout the series, consider the types of numbers being used. Look for opportunities where students learn new mathematics with simpler numbers and later perform operations and apply concepts using the full number system including rational, irrational, and complex numbers.

Throughout the series, find evidence where students apply key takeaways from middle school. Including, but not limited to:

Ratios and Proportional Relationships (6.RP.A; 7.RP.A; 8.EE.B)

- Applying ratios and proportional relationships
- Applying percentages and unit conversions, e.g., in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m^3, acre-feet, etc.)

(Continued)

Functions (8.F)

- Applying basic function concepts, e.g., by interpreting the features of a graph in the context of an applied problem
- Use functions to model relationships

The Number System (6-8.NS)

- Integers, rational numbers, irrational numbers

Geometry (6-8.G)

- Similarity
- Applying concepts and skills of geometric measurement e.g., when analyzing a diagram or schematic

Statistics and Probability (6-8.SP)

- Applying concepts and skills of basic statistics and probability

Note: A problem in which students use reference data to determine the energy cost of different fuels might draw on proportional relationships, unit conversion, and other skills that were first introduced in the middle grades, yet still be a high-school level problem because of the strategic competence required" (p. 10 HS Publishers' Criteria).

If the materials provide resources for differentiated learning, consider whether lower-performing students and/or special populations still have opportunities to engage in non-plus standards experiences appropriate for high school. Note: The quality and types of the differentiation provided by the materials are examined in Gateway 3.

Discussion Points for Cluster Meeting:

How relevant are the contexts to typical high school students? Do the contexts throughout the series reflect changes in students as they mature through high school?

Do students regularly practice operations on rational and irrational numbers? Do the tasks and exercises help students grow in their procedural skills with operations on real numbers?

Which of the key takeaway applications (from Table 1 of the Publishers' Criteria) are present in the series? Are the key takeaways being applied or are they merely absorbed into a procedure? Do the applications of key takeaways occur throughout the series or only within one course?

Scoring:

2 points:

- The materials regularly use age appropriate contexts, use various types of real numbers, and provide opportunities for students to apply key takeaways from grades 6-8.

1 point:

- The materials regularly use age appropriate contexts and apply key takeaways from grades 6-8, yet do not vary the types of real numbers being used.

AND/OR

- The materials regularly use various types of real numbers and apply key takeaways from grades 6-8, yet do not use age appropriate contexts.

AND/OR

- The materials regularly use age appropriate contexts and vary the types of real numbers being used, yet some of the key takeaways from grades 6-8 are not applied.

0 points:

- The materials regularly do not use age appropriate contexts or vary the types of real numbers being used.

AND/OR

- The materials do not apply most of the key takeaways from grades 6-8.

Guidance for Indicator 1d:

Focus: Coherence within and across courses

Criterion: The instructional materials are coherent and consistent with “the high school standards that specify the mathematics which all students should study in order to be college and career ready” (p. 57 of CCSSM).

Indicator 1d: The materials are mathematically coherent and make meaningful connections in a single course and throughout the series, where appropriate and where required by the Standards.

Are the materials mathematically coherent? Do the materials make meaningful connections to prior learning within a course and across the series? Do the materials connect multiple standards and/or clusters in meaningful ways?

Purpose of the Indicator:

This indicator supports the shifts of Focus and Coherence within and across courses throughout the series. This indicator examines the materials to determine if the materials are making meaningful connections to prior learning. Connections between and across multiple standards are made in meaningful ways to support understanding of multiple standards at the same time.

Evidence Collection:

Review the units, chapters and lessons in both student and teacher materials.

Review the course and series scope and sequence.

Review progression documents and standards as needed: CCSSM Progressions documents

Look for evidence throughout the series where students build mathematical knowledge by linking and applying multiple concepts within and across courses.

Look for lesson objectives that develop in a systematic way to meet the full depth of the high school standards.

(Continued)

Identify explicit connections to prior course and series learning for teachers and students. Materials allow teachers to design lessons and units that carefully connect new content and skills to those learned earlier in the course or across the series. For example, lessons and activities that serve to connect two or more clusters in a domain, two or more domains in a conceptual category, or two or more conceptual categories.

Examples of connections between conceptual categories:

- Applying geometric concepts in modeling situations (G-MG) allows students to create equations in one variable (A-CED.1) and use units as a way to understand problems and guide the solution (N-Q.3).
- The correspondence between numerical coordinates and geometric points allows methods from algebra to be applied to geometry and vice versa. The solution set of an equation becomes a geometric curve, making visualization a tool for doing and understanding algebra.
- Functions may be used to describe data; if the data suggest a linear relationship, the relationship can be modeled with a regression line, and its strength and direction can be expressed through a correlation coefficient.

Examples of connections among standards, clusters, and domains:

- The progression from congruence to area to similarity can be used to put each of these topics on a logical footing: The basic assumptions that congruent figures have the same area and that area is invariant under finite dissection bring coherence to the formulas for calculating areas of polygonal regions. These formulas, along with results such as the fact that triangles with equal bases and heights have the same area, can be used to prove properties of dilations and similarity. The triangle similarity criteria are necessary to develop the trigonometry of right triangles.
- Study of linear associations in statistics and probability (S-ID.6c, 7) builds on students' understanding of linear relationships (cf. F-LE.1). Exploration of quadratic relationships in data on two measurement variables (S-ID.6) depends on understanding key features of a quadratic function and being able to interpret them in terms of a context (F-IF..4).

Further examples can be found at PARCC HS Model Content Framework starting on page 73.

Discussion Points for Cluster Meeting:

How is coherence present both within and across courses in the series?

How are the materials using previous course concepts to develop the full depth of the high school standards?

Scoring:

2 points:

- Materials foster coherence through meaningful mathematical connections in a single course and throughout the series, where appropriate and where required by the Standards.

1 point:

- Materials partially foster coherence through meaningful mathematical connections in a single course and throughout the series, where appropriate and where required by the Standards.

0 points:

- Materials do not foster coherence through meaningful mathematical connections in a single course and throughout the series, where appropriate and where required by the Standards.

Guidance for Indicator 1e:

Focus and Coherence: Connect to Grades 6-8 prior knowledge

Criterion: The instructional materials are coherent and consistent with "the high school standards that specify the mathematics which all students should study in order to be college and career ready" (p.57 and 84 of CCSSM).

Indicator 1e: The materials explicitly identify and build on knowledge from Grades 6-8 to the High School Standards.

How do materials explicitly identify and build knowledge from Grades 6-8 to the High School Standards?

Purpose of the Indicator:

This indicator supports the shifts of Focus and Coherence, looking specifically at how the non-plus standards coherently connect to and build upon standards from grades 6-8. This indicator examines the materials to determine if references to standards from grades 6-8 are for the purpose of building on students' previous knowledge and allowing students to make connections to new learning.

Evidence Collection:

Review the units, chapters and lessons in both student and teacher materials.

Review additional documents provided by the publisher, such as scope and sequence materials.

Review criterion 3c on page 11 of the High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013).

Review progression documents and standards as needed: http://ime.math.arizona.edu/progressions/.

Cluster headings in the Standards sometimes signal key moments where reorganizing and extending previous knowledge is important in order to accommodate new knowledge. At other times, the cluster headings signal key connections to grades 6-8. Look for and be mindful of such clusters.

Examples include but are not limited to:

- N-RN.A "Extend the properties of exponents to rational exponents."
- A-REI.C "Solve systems of equations" extends 8.EE.8 "Analyze and solve pairs of simultaneous linear equations."

(Continued)

- F-IF.A “Understand the concept of a function and use function notation” connects naturally with 8.F.A “Define, evaluate, and compare functions.”
- G-.SRT.A “Understand similarity in terms of similarity transformations” builds on the work of 8.G.A “Understand congruence and similarity…”
- G-GMD.A “Explain volume formulas and use them to solve problems” coheres with 8.G.9 “Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems,” 7.G.6 “Solve real-world and mathematical problems involving area, volume…,” and 6.G.A “Solve real-world and mathematical problems involving area, surface area, and volume.”
- G-CO.A “Prove geometric theorems” extends the work of 7.G.5 “Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.”
- S-ID.A “Summarize, represent, and interpret data on a single count or measurement variable” relates well to 6.SP.B “Summarize and describe distributions.”

Throughout the series, look for:

- grades 6-8 standards that are clearly identified as such in both the teacher and student materials.
- connections between 6-8 and high school concepts that are clearly articulated for teachers but may not be explicitly named for students.
- the design of the materials to focus on the connections to mathematics of the previous grades as referenced in the Progression documents.

Determine if standards from grades 6-8 are addressed in an appropriate way for high school; making meaningful connections rather than materials “re-teaching” Grades 6-8 standards.

Examples of grade 6-8 to high school coherence could include, but are not limited to:

- Students work extensively with ratios and proportions in grades 6-8. In high school students work with trigonometric ratios.
- Students work with transformations in order to understand similarity and congruence. In high school, students extend their work with transformations to develop similarity and congruence proofs.
- Students in middle grades worked with measurement units, including units obtained by multiplying and dividing quantities. In high school, students apply these skills in a more sophisticated fashion to solve problems in which reasoning about units adds insight into the structure of the problem and the solutions in context (N-Q).

(Continued)

- Students in grade 8 extended their prior understanding of proportional relationships to begin working with functions with an emphasis on linear functions. In high school, students will master linear and quadratic functions. Students encounter other kinds of functions to ensure that general principles are perceived in generality, as well as to enrich the range of quantitative relationships considered in problems.
- As students acquire mathematical tools from their study of algebra and functions, they apply these tools in statistical contexts (e.g., S-ID.6). In a modeling context, they might informally fit a quadratic function to a set of data, graphing the data and the model function on the same coordinate axes. They also draw on skills they first learned in middle school to apply basic statistics and simple probability in a modeling context. For example, they might estimate a measure of center or variation and use it as an input for a rough calculation.
- In grades 6-8, students worked with a variety of geometric measures (length, area, volume, angle, surface area, and circumference). In high school, students apply these component skills in tandem with others in the course of modeling tasks and other substantial applications (MP4).
- In grade 8, students learned the Pythagorean theorem and used it to determine distances in a coordinate system (8.G.6–8). Early in high school, students prove theorems using coordinates (G-GPE.4–7). Later in high school, students build on their understanding of distance in coordinate systems and draw on their growing command of algebra to connect equations and graphs of conic sections (e.g., G-GPE.1).
- Further examples can be found at PARCC HS Model Content Framework starting on page 44.

Discussion Points for Cluster Meeting:

Are the Grade 6-8 standards explicitly identified?

How are the materials using standards from grades 6 through 8 to develop understanding of high school content?

Are the grades 6-8 connections a purposeful extension or reinforcement of course-level standards, or do the connections unduly interfere with the work of the course/ series?

Scoring:

2 points:

- Content from Grades 6-8 is explicitly identified and supports the progressions of the high school standards.
- Connections between grades 6-8 and high school concepts are present and allow students to extend their previous knowledge.

1 point:

- Content from 6-8 grades is not explicitly identified and/or does not fully support the progressions of the high school standards.
- Connections between grades 6-8 and high school concepts are partially present but may not allow students to extend their previous knowledge.

0 points:

- Content from 6-8 grades is not explicitly identified and does not support the progressions of the high school standards.
- Connections between grades 6-8 and high school concepts are not present and do not allow students to extend their previous knowledge.

Guidance for Indicator 1f:

Focus: Plus Standards ***(This indicator is not scored.)***

Criterion: The instructional materials are coherent and consistent with "the high school standards that specify the mathematics which all students should study in order to be college and career ready" (p. 57 of CCSSM).

Indicator 1f: The plus (+) standards, when included, are explicitly identified and coherently support the mathematics which all students should study in order to be college and career ready.

Are the plus (+) standards explicitly identified and used to coherently support the mathematics which all students should study in order to to be college and career ready?

Purpose of the Indicator:

"The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+)" (CCSSM, p. 57). The purpose of this indicator is to identify the plus standards in the materials, analyze their coherence with non-plus standards within the series, and determine if the materials attend to the full depth of the plus standards when they are addressed.

Evidence Collection:

Note: This indicator is not scored, but it is included in the report. Evidence is identified and collected to show where and how plus (+) standards are included, and how they support coherence of the mathematics students are learning. The report for this indicator should include evidence for the plus standards similar to the evidence collected for the non-plus standards in indicators 1ai, 1aii, 1bii, 1c, 1d, and 1e.

Review the units, chapters, and lessons in both student and teacher materials.

Review additional documents provided by the publisher, such as scope and sequence materials.

Determine which of the plus standards are addressed within the materials and where.

Note if the plus standards are explicitly identified as such in the materials.

Find evidence where the materials reach the full intent of the plus standards.

Look to find connections between non-plus and plus standards. These should be clearly identified and explained for teachers but may not be explicitly named for students.

(Continued)

Look to find connections between plus standards and advanced courses, such as calculus, advanced statistics, or discrete mathematics. These connections should be clearly identified and explained for teachers but may not be explicitly named for students.

Determine if work with the plus standards deters from the work with the non-plus standards.

If the plus standards are separated from non-plus standards in a course within the series, then the evidence should note if this separation is inappropriate or distracting.

Discussion Points for Cluster Meeting:

How are the materials incorporating the plus standards in order to prepare students sufficiently for future advanced level mathematics courses?

How does the treatment of a plus standard enhance the work of the lesson/unit/course?

If a teacher omits a plus standard in the materials, how will the flow of the lesson/unit change? Will omitting a plus standard diminish student opportunity for learning other standards in the lesson/unit?

In what ways do the plus standards serve as purposeful extensions of course-level standards?

Do the plus standards unduly interfere with the work of the course?

Guidance for Indicator 2a:

Rigor and Balance: Conceptual Understanding

Criterion: The instructional materials reflect the balances in the Standards and help students meet the Standards' rigorous expectations, by giving appropriate attention to: developing students' conceptual understanding; procedural skills; and engaging applications.

Indicator 2a: The materials support the intentional development of students' conceptual understanding of key mathematical concepts, especially where called for in specific content standards or clusters.

Do the instructional materials develop conceptual understanding throughout the series? Do the instructional materials provide opportunities for students to independently demonstrate conceptual understanding throughout the series?

Purpose of the Indicator:

This indicator, along with 2b, 2c, and 2d, determines the shift of rigor. In order to obtain rigor, there needs to be a balance among conceptual understanding, procedural skills, and application. Conceptual understanding of key concepts will allow students to be able to access concepts from a number of perspectives in order to see Mathematics as more than a set of algorithmic procedures.

Evidence Collection:

Review criterion 2a on page 9 of the High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013).

Look at resources that help define what conceptual understanding means for mathematics.

- Video: "Building Conceptual Understanding in Mathematics" (NCTM)
- Video: "Conceptual Understanding Excerpt" (The Hunt Institute)
- Reading: "Principles To Actions", (NCTM) p. 42-48

(Continued)

Select cluster(s) or standard(s) that specifically relate to conceptual understanding. Be aware that some cluster(s) and standard(s) lend themselves to more than one aspect of rigor. In such cases, look for evidence of conceptual understanding.

Examples include, but are not limited to:

Clusters/Standards that relate to Conceptual Understanding
N-RN.1 – Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
A-APR.B – Understand the relationship between zeros and factors of polynomials.
A-REI.A – Understand solving equations as a process of reasoning and explain the reasoning.
A-REI.10 – Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
A-REI.11 – Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
F-IF.A – Understand the concept of a function and use function notation.
F-LE.1 – Distinguish between situations that can be modeled with linear functions and with exponential functions.
G-SRT.2 – Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
G-SRT.6 – Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
S-ID.7 – Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

(Continued)

Look for the evidence in lessons, review lessons, chapter and/or unit assessments, homework assignments, concept checks (if offered), hands-on activities (if offered), investigations (if offered), simple tasks and problems, and other areas that appear to be conceptual in nature.

Evaluate whether conceptual understanding present in lessons/chapters/units aligns to the aspect of rigor in the standard(s).

Determine if the materials feature high-quality conceptual problems and conceptual discussion questions, including brief conceptual problems with low computational difficulty.

Determine if the materials offer opportunities for students to engage with concrete and semi-concrete representations, as well as verbalization and writing, when developing conceptual understanding.

Determine if the materials feature opportunities to identify correspondences across mathematical representations in order to further develop conceptual understanding.

> Example: Through the series, the materials do not just offer opportunities for students to engage with different families of functions through equations, tables, graphs, and contexts, but the materials offer opportunities for students to make connections between the different representations for the various families of functions.

Evidence must include specific examples from the instructional materials. Manipulatives do not necessarily indicate conceptual understanding. If evidence includes concrete and/or visual representations, explain how the representations are being used to develop conceptual understanding. If evidence is addressing clusters or standards that relate specifically to conceptual understanding, list the specific clusters/standards and explain how the evidence demonstrates conceptual understanding. If opportunities to develop conceptual understanding are missed, specifically list the clusters/standards/opportunities that are missed.

Note whether the instructional materials include a specific section in units/chapters/lessons, etc that are specifically designed for conceptual understanding. Include Unit, Lesson, Lesson Part and page numbers for reference for all examples.

(Continued)

Discussion Points for Cluster Meeting:

What does intentional development of conceptual understanding look like in materials?

What specific evidence illustrates intentional development of conceptual understanding?

How do the materials in the series enable students to reason in settings involving the careful application of concept definitions, relations, or representations?

Do the materials attend to conceptual understanding throughout the series?

Do the instructional materials provide opportunities for students to independently demonstrate conceptual understanding throughout the series?

Scoring:

2 points:

- The instructional materials develop conceptual understanding throughout the series.
- The instructional materials provide opportunities to independently demonstrate conceptual understanding throughout the series.

1 point:

- The instructional materials have missed opportunities to develop conceptual understanding.

OR

- The instructional materials do not provide students opportunities to independently demonstrate conceptual understanding throughout the series.

0 points:

- The instructional materials have few or no opportunities to develop conceptual understanding.
- The instructional materials do not provide opportunities for students to independently demonstrate conceptual understanding.

Guidance for Indicator 2b:

Rigor and Balance: Procedural Skill and Fluency

Criterion: The instructional materials reflect the balances in the Standards and help students meet the Standards' rigorous expectations, by giving appropriate attention to: developing students' conceptual understanding; procedural skills; and engaging applications.

Indicator 2b: The materials provide intentional opportunities for students to develop procedural skills, especially where called for in specific content standards or clusters.

Do the instructional materials develop procedural skills throughout the series? Do the instructional materials provide opportunities for students to independently demonstrate procedural skills throughout the series?

Purpose of the Indicator:

This indicator, along with 2a, 2c, and 2d, determines the shift of rigor. In order to obtain rigor, there needs to be a balance among conceptual understanding, procedural skills, and application. Procedural skills are the call for efficiency and accuracy in calculations. Students need to practice core skills in order to have access to more complex concepts and procedures.

Evidence Collection:

Review criterion 2b on page 9 of the High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013).

Select cluster(s) or standard(s) that specifically relate to procedural skills. Be aware that some cluster(s) and standard(s) lend themselves to more than one aspect of rigor. In such cases, look for evidence of procedural skills.

Examples include, but are not limited to:

Clusters/Standards that relate to Procedural Skills
A-SSE.1b – Interpret complicated expressions by viewing one or more of their parts as a single entity.
A-SSE.2 – Use the structure of an expression to identify ways to rewrite it.
A-APR.1 – Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
A-APR.6 – Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less

than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
F-BF.3 – Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
G-GPE.4 – Use coordinates to prove simple geometric theorems algebraically.
G-GPE.5 – Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
G-GPE.7 – Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
G-SRT.5 – Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Look for the evidence in lessons, review lessons, routine daily checks, chapter and unit assessments, homework assignments, and other sections demonstrating connections between the development of procedural skills with conceptual understanding.

Evaluate whether aspects of rigor present in lessons/chapters/units align to the aspect of rigor in the targeted standard(s).

Look for purely procedural problems and exercises that include cases in which opportunistic strategies are valuable, as well as generic cases that require efficient algorithms.

> Example of problems when opportunistic strategies are valuable:
> solving the system x + y = 1 and 2x + 2y = 3
>
> Example of problems when generic cases require efficient algorithms:
> the system 2x + 3y = -(1/2)x + 6 – y and 2x + 5 = y + 2

Evidence must include specific examples from the instructional materials. If opportunities to develop procedural skills are missed, specifically list the clusters/standards/opportunities that are missed. Note whether the instructional materials include a specific section in units/chapters/lessons, etc that are specifically designed for procedural skills. Include Unit, Lesson, Lesson Part and page numbers for reference for all examples.

Discussion Points for Cluster Meeting:

The Publishers' Criteria for high school states, "In higher grades, algebra is the language of much of mathematics. Like learning any language, we learn by using it.". Do students have sufficient practice (algebraic or otherwise) in order to be adept/skilled with the operations of mathematics?

How do program materials build procedural skills over a course? Over a series?

Scoring:

2 points:

- The instructional materials develop procedural skills throughout the series.
- The instructional materials provide opportunities to independently demonstrate procedural skills throughout the series.

1 point:

- The instructional materials have missed opportunities to develop procedural skills throughout the series.

OR

- The instructional materials do not provide students opportunities to independently demonstrate procedural skills throughout the series.

0 points:

- The instructional materials have no or few opportunities to develop procedural skills throughout the series.
- The instructional materials do not provide opportunities for students to independently demonstrate procedural skills.

Guidance for Indicator 2c:

Rigor and Balance: Applications

Criterion: The instructional materials reflect the balances in the Standards and help students meet the Standards' rigorous expectations, by giving appropriate attention to: developing students' conceptual understanding; procedural skills; and engaging applications.

Indicator 2c: The materials support the intentional development of students' ability to utilize mathematical concepts and skills in engaging applications, especially where called for in specific content standards or clusters.

Do the instructional materials develop students' ability to utilize mathematical concepts and skills in engaging applications throughout the series? Do the instructional materials provide opportunities for students to independently utilize mathematical concepts and skills in engaging applications throughout the series?

Purpose of the Indicator:

This indicator, along with 2a, 2b, and 2d, determines the shift of rigor. In order to obtain rigor, there needs to be a balance among conceptual understanding, procedural skills, and application. To engage in application, students need opportunities to apply mathematical knowledge and skills in a real-world context. Materials should promote problem-solving activities that call for using Mathematics flexibly in routine and non-routine contexts.

Evidence Collection:

Review criterion 2c on page 10 of the High School Publishers' Criteria for the Common Core State Standards for Mathematics (Spring 2013).

Look at resources that help define what applications means for mathematics.

> Reading: Chapter 1 of The GAIMME Report (A link to this report cannot be provided, but it can be downloaded by googling "The GAIMME Report".)
>
> Reading: "Math Modeling: Getting Started & Getting Solutions" (A link to this handbook cannot be provided, but it can be downloaded by googling "SIAM and Moody's modeling handbook".)
>
> Reading: "How to Identify Tasks that Engage Students in Mathematical Modeling NCTM-SIAM Committee on Modeling Across the Curriculum".

(Continued)

Select cluster(s) or standard(s) that specifically relate to application. Be aware that some cluster(s) and standard(s) lend themselves to more than one aspect of rigor. In such cases, look for evidence of application.

Examples include, but are not limited to:

Clusters/Standards that relate to Applications
N-Q.A – Reason quantitatively and use units to solve problems.
A-SSE.3 – Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★
A-REI.11 – Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
F-IF.B – Interpret functions that arise in applications in terms of the context.
F-IF.7 – Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★
F-BF.1 – Write a function that describes a relationship between two quantities.★
G-SRT.8 – Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★
S-ID.2 – Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
S-IC.1 – Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

Determine if there is a variety of single and multi-step contextual problems, including non-routine problems, that develop the Mathematics of the non-plus standards.

Look for evidence where application problems particularly stress applying the content of the non-plus standards.

(Continued)

Consider if applications build over the series.

Determine if the materials include an ample number of contextual problems that develop the mathematics of the course.

Note when the materials:

- afford opportunities for students to engage in and practice problem solving,
- allow or require students to make their own assumptions or simplifications in order to model a situation mathematically, and
- provide problems to be worked individually as well as classroom activities centered on application scenarios.

Evidence must include specific examples from the instructional materials. If opportunities for application are missed, specifically list the clusters/standards/opportunities that are missed. Note whether the instructional materials include a specific section in units/chapters/lessons, etc that are specifically designed for application. Include Unit, Lesson, Lesson Part and page numbers for reference for all examples.

Discussion Points for Cluster Meeting:

Where do the materials provide opportunities for students to engage in problem solving?

Do the materials require greater levels of problem solving sophistication as the series progresses?

How do the materials throughout the series enable students to solve non-routine problems and/or apply mathematics to contextual situations?

Scoring:

2 points:

- The instructional materials include multiple opportunities for students to engage in routine and non-routine application of mathematics throughout the series.
- The instructional materials provide opportunities to independently demonstrate the use of mathematics flexibly in a variety of contexts.

1 point:

- The instructional materials have missed opportunities to engage in non-routine application of mathematics throughout the series.

OR

- There is little variety in situational contexts/problem types when students are presented with word problems.

OR

- The instructional materials do not provide opportunities to independently demonstrate the use of mathematics flexibly in a variety of contexts.

0 points:

- The instructional materials have no or few opportunities to engage in application of mathematics throughout the series.
- The instructional materials do not provide opportunities to independently demonstrate the use of mathematics flexibly in a variety of contexts.

Guidance for Indicator 2d:

Balance

Criterion: The instructional materials reflect the balances in the Standards and help students meet the Standards' rigorous expectations, by giving appropriate attention to: developing students' conceptual understanding; procedural skills; and engaging applications.

Indicator 2d: The three aspects of rigor are not always treated together and are not always treated separately. The three aspects are balanced with respect to the standards being addressed.

Do the instructional materials balance the three aspects of rigor?

Purpose of the Indicator:

This indicator, along with 2a, 2b, and 2c, determines the shift of rigor. In order to be considered rigorous, program materials must include a balance of conceptual understanding, procedural skills, and application. This balance should be evident in all aspects of the high school series and in each course to support students as they develop mathematical understanding.

Evidence Collection:

Review lessons, chapter/unit assessments, and homework assignments.

Look for individual lessons/topics, as well as complete units, that include more than one aspect of rigor.

Look at resources that help define what balance means for mathematics.

- Video: "The Balance Between Skills and Understanding" (The Hunt Institute)
- Video: "Mathematics Fluency: A Balanced Approach" (The Hunt Institute)
- Reading: "Additional Aspects of the Rigor and Balance Criterion" (Publishers' Criteria, p. 10)

Look for a balance of all three aspects of rigor, considering the program materials as a whole and as individual units of study.

- Consider whether the content/topic is being introduced to students for the first time or is an extension of previous learning.
- Consider whether materials in the series simultaneously develop conceptual understandings and procedural skills.
- Be mindful of where students are encouraged to use multiple representations and written explanations to support their work in application problems.

For this indicator, consider the intent of the series to balance the three aspects of rigor, not the quality of the materials—indicators 2a-c focus on the quality of rigor within the materials.

Determine if the materials consistently balance the three aspects of rigor while allowing for dedicated focus on each individual aspect.

Determine if the materials neglect to attend to all aspects of rigor specified by the standards or clusters.

Examples may include, but are not limited to:

- With A-APR.1, the materials fully develop students adding, subtracting, and multiplying polynomials, but the materials do not engage students in understanding that polynomials form a system closed under addition, subtraction, and multiplication.
- With A-REI.11, the materials have students find solutions to systems of equations through applications, but the materials do not have students develop conceptual understanding by explaining why the *x*-coordinates of the points where two graphs intersect are the solutions to setting the two equations equal to each other.

Evidence must include explicit examples of where *more than one* aspect of rigor is present (can be two or three aspects, but does not have to include all three) ***and*** where only *one aspec*t of rigor is present. Look for lessons that call out specific components of rigor, and lessons that focus on individual aspects of rigor.

NOTE: Evidence should be different then the evidence collected for 2a, 2b, and 2c.

Discussion Points for Cluster Meeting:

Do the materials intentionally focus on one aspect of rigor over the others in specific units? If so, do the materials work to maintain balance throughout the course?

Do the materials focus on one aspect of rigor over the others in a single course?

Do the materials neglect one aspect of rigor throughout a course?

Scoring:

Note: Indicator 2d is not focused on the qualitative aspects of conceptual understanding (2a), procedural skills (2b), and application (2c). In Indicator 2d we are looking for evidence of the balance among these three aspects of rigor.

2 points:
- All three aspects of rigor are present independently throughout the program materials.
- Multiple aspects of rigor are engaged ***simultaneously*** to develop students' mathematical understanding of a single topic/unit of study throughout the materials.

1 point:
- All three aspects of rigor are present in program materials, but there is some over/under-emphasis of 1 of the 3 aspects.

0 points:
- No/minimal evidence is present of one of the three aspects of rigor in program materials.
- Program materials have an overwhelming emphasis on one aspect of rigor, with little attention paid to the other aspects.

Guidance for Indicator 2e:

Practice-Content Connections: Overarching Habits of Mind (MP1, Make sense of problems and persevere in solving them, and MP6, Attend to precision)

Criterion: Materials meaningfully connect the Standards for Mathematical Content and the Standards for Mathematical Practice.

Indicator 2e: The materials support the intentional development of overarching, mathematical practices (MPs 1 and 6), in connection to the high school content standards, as required by the Standards for Mathematical Practice.

Across the series, are MP1 and MP6 used to enrich the mathematical content? Across the series, is there intentional development of MP1 and MP6 that reaches the full intent of the MPs?

Purpose of the Indicator:

This indicator, along with 2f, 2g, and 2h, determines the adherence to the Standards for Mathematical Practice. This indicator specifically looks at MPs 1 and 6 which address overarching, mathematical practices. It assesses whether the provided opportunities for student engagement with the math practices are a) used to enrich the mathematics content of the courses and b) fully developed across the series to meet the level of expectation of high school mathematical study.

Evidence Collection:

Look at all lessons in teacher's manuals and in the student materials to ensure that MP1 and MP6 are occurring throughout the courses.

Look in unit overviews, scope and sequence charts, and/or other instructional guides to ensure that MP1 and MP6 are occurring throughout the courses of the series.

Record any instances where MP1 and MP6 are misleading in the curricular materials (e.g. a lesson is marked as aligned to an MP when only a small part addresses that, or vice versa).

(Continued)

To check that MP1 and MP6 are being used to enrich the mathematics content and are fully developed to meet the level of expectation for high school:

> Thoroughly reexamine the practice standards MP1 and MP6. This compilation document and this Mathematical Practice Message might be helpful.
>
> Look at lessons, assessments and any examples/descriptions of anticipated student work. Look for places that require students to:
> - analyze and make sense of problems
> - find solution pathways
> - engage in problem solving
> - persevere in solving problems
> - monitor and evaluate their progress in solving problems
> - determine if their answers make sense
> - reflect on and revise their problem solving strategies
> - check their answers with different methods
> - use accurate, precise mathematical language (vocabulary and conventions)
> - specify units of measure
> - state the meaning of symbols
>
> Look at teacher directions and how teachers are guided to carry out the lessons. In particular, look for places where teachers are expected to:
> - pose rich problems
> - provide time for students to make sense of problems
> - provide opportunities for students to engage in problem solving
> - ask clarifying and probing questions
> - ensure students know and use clear definitions
> - model accurate, precise mathematical language (vocabulary and conventions)

Check to see if any materials focus only on the Standards for Mathematical Practice (therefore, they are not being used to enrich the mathematical content). Record any instances where the Standards for Mathematical Practice are not being used to enrich the mathematics content.

Verify that student engagement with the lessons and assessments would require use of the Standards for Mathematical Practice so that across the series students will develop their use of the MPs to the full intent of the standards.

Record any instances where a MP was identified, however, engagement with the lesson or task would only require minimal or trivial use of the indicated MP.

(Continued)

If MPs are only located in a specific part of the teacher's manuals (e.g. the teacher-led portion of the lesson), you will need to look at other sections (e.g. independent work, homework, assessments) to ensure that the MPs are intentionally used to enrich the content. **Look not only where the MPs are identified, but also look at places where they are not identified.**

Discussion Points for Cluster Meeting:

When do the MPs, when used by the students, enrich the mathematical content in an authentic way and ensure a progression through high school courses to the full intent of the MPs?

Do expectations for students increase throughout courses and the series?

Do the materials provide guidance to teachers in order to develop students' skills identified in MP1 and MP6?

Scoring:

Note: If the instructional materials do not identify the MPs for teachers, evidence of this will be included in the criterion summary report for Practice-Content Connections, and the lack of identification of the MPs will be reflected in the scoring for indicator 2e only.

2 points:

- The majority of the time MP1 and MP6 are used to enrich the mathematical content.

AND

- Across the series, there is intentional development of MP1 and MP6 that reaches the full intent of the MPs. (Note: If the materials implement the full intent of the MPs from the beginning of the series, then the materials do not have to also include an intentional development of the MPs across the series.)

1 point:

- There are a few instances where MP1 and MP6 do not enrich the content.

AND/OR

- The materials do not develop either MP1 or MP6 to the full intent of the standards

AND/OR

- There are many examples of misleading identifications.

0 points:

- MP1 and MP6 are not used to enrich the content.

AND/OR

- The materials do not develop both MP1 and MP6 to the full intent of the standards

AND/OR

- MP1 and MP6 are regularly treated as separate from the mathematical content.

Guidance for Indicator 2f:

Practice-Content Connections: Reasoning and Explaining (MP2, Reason abstractly and quantitatively, and MP3, Construct viable arguments and critique the reasoning of others)

Criterion: Materials meaningfully connect the Standards for Mathematical Content and the Standards for Mathematical Practice.

Indicator 2f: The materials support the intentional development of reasoning and explaining (MPs 2 and 3), in connection to the high school content standards, as required by the Standards for Mathematical Practice.

Across the series, are MP2 and MP3 used to enrich the mathematical content? Across the series, is there intentional development of MP2 and MP3 that reaches the full intent of the MPs?

Purpose of the Indicator:

This indicator, along with 2e, 2g, and 2h, determines the adherence to the Standards for Mathematical Practice. This indicator specifically looks at MPs 2 and 3 which address practices of reasoning and explaining. It assesses whether the provided opportunities for student engagement with the math practices are a) used to enrich the mathematics content of the courses and b) fully developed across the series to meet the level of expectation of high school mathematical study.

Evidence Collection:

Look at all lessons in teacher's manuals and in the student materials to ensure that MP2 and MP3 are occurring throughout the courses.

Look in unit overviews, scope and sequence charts, and/or other instructional guides to ensure that MP2 and MP3 are occurring throughout the courses of the series.

Record any instances where MP2 and MP3 are misleading in the curricular materials (e.g. a lesson is marked as aligned to an MP when only a small part addresses that, or vice versa).

(Continued)

To check that MP2 and MP3 are being used to enrich the mathematics content and are fully developed to meet the level of expectation for high school:

> Thoroughly reexamine the practice standards MP2 and MP3. This compilation document and this Mathematical Practice Message might be helpful.
>
> Look at lessons, assessments and any examples/descriptions of anticipated student work. Look for places that require students to:
> - represent situations symbolically
> - consider units involved in a problem and attend to the meaning of quantities
> - understand the relationships between problem scenarios and mathematical representations
> - explain/discuss what the numbers or symbols in an expression/equation represent
> - determine if their answers make sense
> - explain/justify their reasoning
> - create their own conjectures
> - listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments
>
> Look at teacher directions and how teachers are guided to carry out the lessons. In particular, look for places where teachers are expected to:
> - ensure students make connections between mathematical representations and scenarios
> - provide opportunities for students to engage in active mathematical discourse
> - ask clarifying and probing questions

Check to see if any materials focus only on the Standards for Mathematical Practice (therefore, they are not being used to enrich the mathematical content). Record any instances where the Standards for Mathematical Practice are not being used to enrich the mathematics content.

Verify that student engagement with the lessons and assessments would require use of the Standards for Mathematical Practice so that across the series students will develop their use of the MPs to the full intent of the standards.

Record any instances where an MP was identified, however, engagement with the lesson or task would only require minimal or trivial use of the indicated MP.

If you found that MPs are only located in a specific part of the teacher's manuals (e.g. the teacher-led portion of the lesson), you will need to look at other sections (e.g. independent work, homework, assessments) to ensure that the MPs are intentionally used to enrich the content. **Look not only where the MPs are identified in the materials, but also look at places where they are not identified.** It may help to search for keywords like conjecture, explain, justify, discuss, analyze, ask, and clarify.

Discussion Points for Cluster Meeting:

When do the MPs, when used by the students, enrich the mathematical content in an authentic way and ensure a progression through high school courses to the full intent of the MPs?

Do expectations for students increase throughout courses and the series?

Do the materials provide guidance to teachers in order to develop students' skills identified in MP2 and MP3?

Scoring:

2 points:

- The majority of the time MP2 and MP3 are used to enrich the mathematical content.

AND

- Across the series, there is intentional development of MP2 and MP3 that reaches the full intent of the MPs. (Note: If the materials implement the full intent of the MPs from the beginning of the series, then the materials do not have to also include an intentional development of the MPs across the series.)

1 point:

- There are a few instances where MP2 and MP3 do not enrich the content.

AND/OR

- The materials do not develop either MP2 or MP3 to the full intent of the standards.

AND/OR

- There are many examples of misleading identifications.

0 points:

- MP2 and MP3 are not used to enrich the content.

AND/OR

- The materials do not develop both MP2 and MP3 to the full intent of the standards.

AND/OR

- MP2 and MP3 are regularly treated as separate from the mathematics content.

Guidance for Indicator 2g:

Practice-Content Connections: Modeling and Using Tools (MP4, Model with mathematics, and MP5, Use appropriate tools strategically)

Criterion: Materials meaningfully connect the Standards for Mathematical Content and the Standards for Mathematical Practice.

Indicator 2g: The materials support the intentional development of modeling and using tools (MPs 4 and 5), in connection to the high school content standards, as required by the Standards for Mathematical Practice.

Across the series, are MP4 and MP5 used to enrich the mathematical content? Across the series, is there intentional development of MP4 and MP5 that reaches the full intent of the MPs?

Purpose of the Indicator:

This indicator, along with 2e, 2f, and 2h, determines the adherence to the Standards for Mathematical Practice. This indicator specifically looks at MPs 4 and 5 which address mathematical modeling and use of appropriate tools. It assesses whether the provided opportunities for student engagement with the math practices are a) used to enrich the mathematics content of the courses and b) fully developed across the series to meet the level of expectation of high school mathematical study.

Evidence Collection:

Look at all lessons in teacher's manuals and in the student materials to ensure that MP4 and MP5 are occurring throughout the courses.

Look in unit overviews, scope and sequence charts, and/or other instructional guides to ensure that MP4 and MP5 are occurring throughout the courses of the series.

Record any instances where MP4 and MP5 are misleading in the curricular materials (e.g. a lesson is marked as aligned to an MP when only a small part addresses that, or vice versa).

To check that MP4 and MP5 are being used to enrich the mathematics content and are fully developed to meet the level of expectation for high school:

> Thoroughly reexamine the practice standards MP4 and MP5. This compilation document and this Mathematical Practice Message might be helpful.

(Continued)

Look at lessons, assessments and any examples/descriptions of anticipated student work. Look for places that require students to:

- engage in the modeling cycle
- apply prior knowledge to new problems
- identify important relationships and map relationships with tables, diagrams, graphs, rules, etc.
- draw conclusions from solutions as they pertain to a situation
- ***choose appropriate tools***
- use multiple tools to represent information in a situation
- create and use models to represent

*also consider whether the materials encourage opportunities for students to use technological tools to explore and deepen their understanding of concepts

Look at teacher directions and how teachers are guided to carry out the lessons. In particular, look for places where teachers are expected to:

- Pose problems connected to previous concepts
- Provide a variety of real world contexts
- Provide meaningful, real-world, authentic performance tasks
- Promote discourse and investigation
- Make a variety of tools available
- Model tools effectively, including their benefits and limitations
- Encourage the use of multiple tools for communication, calculation, investigation, sense-making, etc.

Check to see if any materials focus only on the Standards for Mathematical Practice (therefore, they are not being used to enrich the mathematical content). Record any instances where the Standards for Mathematical Practice are not being used to enrich the mathematics content.

Verify that student engagement with the lessons and assessments would require use of the Standards for Mathematical Practice so that across the series students will develop their use of the MPs to the full intent of the standards.

Record any instances where an MP was identified, however, engagement with the lesson or task would only require minimal or trivial use of the indicated MP.

If you found that MPs are only located in a specific part of the teacher's manuals (e.g. the teacher-led portion of the lesson), you will need to look at other sections (e.g. independent work, homework, assessments) to ensure that the MPs are intentionally used to enrich the content. **Look not only where the MPs are identified in the materials, but also look at places where they are not identified.**

Discussion Points for Cluster Meeting:

When do the MPs, when used by the students, enrich the mathematical content in an authentic way and ensure a progression through high school courses to the full intent of the MPs?

Do expectations for students increase throughout courses and the series?

Do the materials provide guidance to teachers in order to develop students' skills identified in MP4 and MP5?

Scoring:

2 points:

- The majority of the time MP4 and MP5 are used to enrich the mathematical content.

AND

- Across the series, there is intentional development of MP4 and MP5 that reaches the full intent of the MPs. (Note: If the materials implement the full intent of the MPs from the beginning of the series, then the materials do not have to also include an intentional development of the MPs across the series.)

1 point:

- There are a few instances where MP4 and MP5 do not enrich the content.

AND/OR

- The materials do not develop either MP4 or MP5 to the full intent of the standards.

AND/OR

- There are many examples of misleading identifications.

0 points:

- MP4 and MP5 are not used to enrich the content.

AND/OR

- The materials do not develop both MP4 and MP5 to the full intent of the standards.

AND/OR

- MP4 and MP5 are regularly treated as separate from the mathematics content.

Guidance for Indicator 2h:

Practice-Content Connections: Seeing Structure and Generalizing (MP7, Look for and make use of structure, and MP8, Look for and express regularity in repeated reasoning)

Criterion: Materials meaningfully connect the Standards for Mathematical Content and the Standards for Mathematical Practice.

Indicator 2h: The materials support the intentional development of seeing structure and generalizing (MPs 7 and 8), in connection to the high school content standards, as required by the Standards for Mathematical Practice.

Across the series, are MP7 and MP8 used to enrich the mathematical content? Across the series, is there intentional development of MP7 and MP8 that reaches the full intent of the MPs?

Purpose of the Indicator:

This indicator, along with 2e, 2f, and 2g, determines the adherence to the Standards for Mathematical Practice. This indicator specifically looks at MPs 7 and 8 which support the intentional development of seeing structure and generalizing. It assesses whether the provided opportunities for student engagement with the math practices are a) used to enrich the mathematics content of the courses and b) fully developed across the series to meet the level of expectation of high school mathematical study.

Evidence Collection:

Look at all lessons in teacher's manuals and in the student materials to ensure that MP7 and MP8 are occurring throughout the courses.

Look in unit overviews, scope and sequence charts, and/or other instructional guides to ensure that MP7 and MP8 are occurring throughout the courses of the series.

Record any instances where MP7 and MP8 are misleading in the curricular materials (e.g. a lesson is marked as aligned to an MP when only a small part addresses that, or vice versa).

To check that MP7 and MP8 are being used to enrich the mathematics content and are fully developed to meet the level of expectation for high school:

> Thoroughly reexamine the practice standards MP7 and MP8. This compilation document and this Mathematical Practice Message might be helpful.

(Continued)

Look at lessons, assessments and any examples/descriptions of anticipated student work. Look for places that require students to:

- Look for patterns and make generalizations.
- Look and explain the structure of expressions.
- Look at and decompose "complicated" into "simpler" things.
  E.g. seeing $\sin^2 x + 2\sin x + 1$ as $u^2 + 2u + 1$.
- Analyze a problem and look for more than one approach.
- Look for shortcuts and general methods when calculations/processes are repeated.
- Describe a general formula, process, or algorithm.

Look at teacher directions and how teachers are guided to carry out the lessons. In particular, look for places where teachers are expected to:

- Provide tasks/problems with patterns.
- Prompt students to look for structure and patterns.
- Prompt students to describe what they see in the structure/pattern.
  E.g. Ask a student to explain how his/her expression "4n + 1" can be seen in the tile pattern.
- Provide time for students to look for patterns, structure, shortcuts, generalizations, etc.
- Ask probing questions like "Does that always work?" or "Why does that work?"

Check to see if any materials focus only on the Standards for Mathematical Practice (therefore, they are not being used to enrich the mathematical content). Record any instances where the Standards for Mathematical Practice are not being used to enrich the mathematics content.

Verify that student engagement with the lessons and assessments would require use of the Standards for Mathematical Practice so that across the series students will develop their use of the MPs to the full intent of the standards.

Record any instances where an MP was identified, however, engagement with the lesson or task would only require minimal or trivial use of the indicated MP.

If you found that MPs are only located in a specific part of the teacher's manuals (e.g. the teacher-led portion of the lesson), you will need to look at other sections (e.g. independent work, homework, assessments) to ensure that the MPs are intentionally used to enrich the content. **Look not only where the MPs are identified in the materials, but also look at places where they are not identified.**

Discussion Points for Cluster Meeting:

When do the MPs, when used by the students, enrich the mathematical content in an authentic way and ensure a progression through high school courses to the full intent of the MPs?

Do expectations for students increase throughout courses and the series?

Do the materials provide guidance to teachers in order to develop students' skills identified in MP7 and MP8?

Scoring:

2 points:

- The majority of the time MP7 and MP8 are used to enrich the mathematical content.

AND

- Across the series, there is intentional development of MP7 and MP8 that reaches the full intent of the MPs. (Note: If the materials implement the full intent of the MPs from the beginning of the series, then the materials do not have to also include an intentional development of the MPs across the series.)

1 point:

- There are a few instances where MP7 and MP8 do not enrich the content.

AND/OR

- The materials do not develop either MP7 or MP8 to the full intent of the standards.

AND/OR

- There are many examples of misleading identifications.

0 points:

- MP7 and MP8 are not used to enrich the content.

AND/OR

- The materials do not develop both MP7 and MP8 to the full intent of the standards.

AND/OR

- MP7 and MP8 are regularly treated as separate from the mathematics content.

Guidance for Indicator 3a-3e:

Use and Design Facilitate Student Learning

Criterion: Materials are well designed and take into account effective lesson structure and pacing.

Indicators 3a - 3e:

3a. The underlying design of the materials distinguishes between problems and exercises. In essence, the difference is that in solving problems, students learn new mathematics, whereas in working exercises, students apply what they have already learned to build mastery. Each problem or exercise has a purpose.

3b. Design of assignments is not haphazard: tasks are given in intentional sequences.

3c. There is variety in how students are asked to present the mathematics. For example, students are asked to produce answers and solutions, but also, arguments and explanations, diagrams, mathematical models, etc.

3d. Manipulatives, both virtual and physical, are faithful representations of the mathematical objects they represent and when appropriate are connected to written methods.

3e. The visual design (whether in print or digital) is not distracting or chaotic, but supports students in engaging thoughtfully with the subject.

Evidence Collection with Guiding Questions:

3a and 3b

Review lessons, sample problems, student practice pages, and homework assignments.

Review any teacher information provided on lesson purpose.

Review selection, sequence, and use of manipulatives with problems/student exercises.

Focus on the coherence between the sample problems within each lesson and the student practice/ assignments that follow.

Use the questions below to gather evidence to inform the rating of these indicators.

> Do the problems within the lesson allow students to learn new mathematics at an appropriate pace for the given course level?
>
> Do the practice pages that follow allow students to utilize the new mathematics in order to further develop their knowledge of the new content?
>
> Do all problems and exercises have a purpose toward developing the new content of the lesson?
>
> Are there any instances of new mathematics in the “exercises” that was not part of the “problems”?
>
> Are there any instances where the sequencing of assignments is haphazard in development, i.e. abstract before concrete, unnatural flow of material, etc.?

3c

Review lessons, sample problems, practice problems, homework problems, and assessment questions for types of student products.

Focus on the variety of ways students are asked to demonstrate mathematical learning.

Use the questions below to gather evidence to inform the rating of this indicator.

- Are students asked to produce many types of answers throughout the work they do?
- Are students asked to produce models, practice fluency, create arguments, justify their answers, attend to mathematical practices, and make real-world connections?

3d

Review student, teacher, digital, and additional materials.

Focus on whether manipulatives are appropriately used and explained.

Use the questions below to gather evidence to inform the rating of this indicator.

- Are the manipulatives consistent representations of the mathematical objects?
- Are the manipulatives connected to written methods?

3e

Examine the visual design and layout of teacher and student materials.

Focus on the materials' visual appearance and ability to support student engagement.

Use the questions below to gather evidence to inform the rating of this indicator.

- Do the materials maintain a consistent layout for each lesson?
- Are the pictures and models supportive of student learning and engagement without being visually distracting?

Discussion Points for Cluster Meeting:

Preparing for discussion—questions to ask yourself:

3a

What is the difference between “problems” and “exercises” within the materials?

How do the materials encourage students to apply new mathematics learned in the exercises?

3b

Is there a natural progression from the “problems” to student assignments?

Is there a natural progression within student assignments leading to full understanding and mastery of new mathematics?

3c

What are the different types of products students must provide?

Do student products range from fluency to higher-level thinking?

3d

Are manipulatives presented? If so, do they represent mathematical objects while connecting to written methods?

3e

What visual designs distract students? What visual designs create student engagement?

During discussion:

3a

Discuss the difference between problems and exercises within the structure of the materials. Note the terminology the series uses to differentiate.

Discuss the effectiveness of problems in allowing students to learn new mathematics at an appropriate pace. Note specific instances where these problems do not serve the purpose intended within the lesson.

Discuss the effectiveness of the exercises in allowing students to apply learned mathematics in order to build knowledge. Note specific instances where these exercises do not serve the purpose intended within the lesson.

Note any instances of new mathematics being presented within the student exercises.

3b

Note any instances of unnatural sequencing within student assignments.

3c

Discuss the types of products students are asked to create and determine if there is variety. Note if students are asked to create products at various levels of thinking.

3d

Discuss the effectiveness of manipulatives as faithful representations of the mathematical objects. Note if manipulatives connect to written methods.

3e

Discuss whether the visual design has a consistent layout in both the teacher and student materials. Note if the design is distracting or chaotic.

Scoring:

2 points:

3a

- Materials distinguish between problems and exercises within each lesson.
- Students are learning new mathematics within each lesson and then applying what they have learned in order to build knowledge.
- There are no, or very few, instances of new mathematics being presented in the student exercises.
- All, or most, problems or exercises have a purpose.

3b

- Exercises within student assignments are intentionally sequenced to build understanding and knowledge.

3c

- Students are asked to demonstrate their learning using a variety of products.

3d

- Manipulatives are present, faithful representations of mathematical objects and are connected to written methods.

1 point:

3a

- Distinguishing between problems and exercises within lessons is confusing or difficult.
- A lack of cohesiveness sometimes exists between the problems and exercises within lessons.
- There are some instances of new mathematics being presented in the student exercises.
- There are some instances of problems or exercises not serving a purpose within lessons.

3b

- Some instances of confusion in student assignment sequencing and design exist.

3c

- Students are asked to demonstrate their learning using products with some variety.

3d

- Manipulatives are present but do not consistently represent mathematical objects and/or are not connected to written methods.

0 points:

3a

- It is not possible to distinguish between problems and exercises within lessons.
- There is a consistent lack of cohesiveness between the problems and exercises within lessons.
- There are many instances of new mathematics being presented in the student exercises.
- Many instances exist of problems or exercises not serving a purpose within lessons.

3b

- Many instances of confusion in student assignment sequencing and design exist.

3c

- There is no variety in what students are asked to produce.

3d

- Manipulates are not present or do not accurately represent mathematical objects.

Note: No score is given for indicator 3e (visual design). Only qualitative evidence is provided.

Guidance for Indicator 3f-3l:

Teacher Planning and Learning for Success with CCSS

Criterion: Materials support teacher learning and understanding of the Standards.

Indicators 3f -3l:

3f. Materials support teachers in planning and providing effective learning experiences by providing quality questions to help guide students' mathematical development.

3g. Materials contain a teacher's edition with ample and useful annotations and suggestions on how to present the content in the student edition and in the ancillary materials. Where applicable, materials include teacher guidance for the use of embedded technology to support and enhance student learning.

3h. Materials contain a teacher's edition that contains full, adult-level explanations and examples of the more advanced mathematics concepts and the mathematical practices so that teachers can improve their own knowledge of the subject, as necessary.

3i. Materials contain a teacher's edition that explains the role of the specific mathematics standards in the context of the overall series.

3j. Materials provide a list of lessons in the teacher's edition, cross-referencing the standards addressed and providing an estimated instructional time for each lesson, chapter and unit (i.e., pacing guide).

3k. Materials contain strategies for informing students, parents, or caregivers about the mathematics program and suggestions for how they can help support student progress and achievement.

3l. Materials contain explanations of the instructional approaches of the program and identification of the research-based strategies.

Evidence Collection with Guiding Questions:

Look at both print and digital (if accessible) teacher's materials for:

3f

Any overview sections and/or annotations that contain narrative information about the math content and/or quality questions to help guide students' mathematical development.

3g

Any overview sections and/or annotations that contain narrative information about the math content and/or ancillary documents that will assist the teacher in presenting the student material. Also look for embedded technology links that will enhance the learning for all students.

3h

Annotations on how to present the information in the student editions to assist in full understanding of the standards and other supports that will assist a teacher in developing their own understanding allowing for seamless transitions of that knowledge to student learning.

3i

Chapter or lesson overviews that explain the progression of the content and how this specific course connects to previous and upcoming courses.

3j – 3l

Beginning sections of the entire book, unit, chapter, lesson that contains overview sections, teacher instruction pages, or ancillary supports that contain:

> A narrative mathematical explanation of the math content in each topic paying attention to key instruction that will inform others that may be assisting the child in their progress at school.
>
> Teacher instruction pages for any identified research-based strategies.
>
> Pacing guides with number of days of instruction and how many minutes of instruction are contained in each of those days.

After you have located the needed materials in the teacher's and/or digital materials:

3f

Read the guiding questions to ensure that they would truly lead to a student's mathematical development and would allow for deeper thinking.

3g

If technology support is embedded, it is overarching and accessible to most.

Knowledge of content that is included is accurate and understandable and gives true assistance to all educators using the materials.

3i

There is information given to allow for coherence, not just a single course above or below, but there are multiple course levels, if applicable, to allow a teacher to make prior connections and teach for connections to future content.

3j – 3l

Looking at the standards being taught in the lessons, chapters, units and the timeline given to teach those standards, ensure that it is reasonable and useful for the educator.

Discussion Points for Cluster Meeting:

Discuss the ease of finding the needed resources and the time commitment it would require to gather these resources to ensure that they would be useful.

Discuss the level of support needed in questioning, timeline, content assistance, etc. to ensure the teacher has the needed material to prepare students for the upcoming course's mathematics.

Scoring:

2 points:

3f

Guiding questions are consistently provided to assist in students' mathematical development.

All/most questions are of high quality and encourage deep thinking, not just knowledge retrieval.

3g

Content knowledge is included, where needed, and is accurate, understandable, and gives true assistance to all educators using the text.

When applicable and would enhance student learning, technology support is embedded, overarching and accessible to most. If technology support is never included, this indicator cannot get full points.

3h

More advanced mathematics concepts are consistently explained and will improve a teacher's deeper understanding of the content.

Explanations are accessible to all educators.

3i

Explanations of the role of the specific course-level mathematics in the context of the overall mathematics materials are offered, at a minimum, in each unit/module.

Explanations are not always given as just one course level below or above but give connections among multiple course levels.

1 point:

3f

Guiding questions are occasionally provided to assist in students' mathematical development.

Some questions are of high quality and encourage deep thinking, not just knowledge retrieval.

3g

Content knowledge is included; however, it is not always where needed and is not always accurate and understandable to give true assistance to all educators using the materials.

When applicable and would enhance student learning, technology support is embedded and is overarching and accessible to most. However, sometimes technology supports that would enhance the student learning are omitted.

3h

More advanced mathematics concepts are occasionally explained and will improve a teacher's deeper understanding of the content, but some major explanations are missing or not able to assist an educator in their own knowledge level of the mathematics.

Some explanations are accessible to all educators.

3i

Explanations of the role of the specific course-level mathematics in the context of the overall mathematics materials are offered, but the explanations are general and too overarching to assist an educator in truly understanding the role of the specific course-level mathematics in the context of the series.

Explanations are given, but there are some just one course level below or above.

0 points:

3f

Guiding questions are never, or rarely, provided to assist in students' mathematical development.

Questions that are provided require no analysis, all or most require just knowledge retrieval.

3g

Content knowledge is not included, or if it is, the content knowledge is often not accurate or helpful.

No technology supports are included.

3h

More advanced mathematics concepts aren't explained in the teacher's materials, or they are explained at a level that would not deepen a teacher's understanding of the content.

Explanations are given, but they are difficult to access or use to deepen teachers' knowledge.

3i

There are few, if any, explanations of the role of the specific course-level mathematics in the context of the overall mathematics materials, and/or the explanations are too general for teachers to see the connections.

Explanations, if given, are only addressing within course-level connections or just one course level below or above.

Note: No score is given for indicators 3j (list of lessons), 3k (strategies for informing parents), and 3l (explanations of instructional approaches). Only qualitative evidence is provided.

Guidance for Indicator 3m-3q:

Assessment

Criterion: Materials offer teachers resources and tools to collect ongoing data about student progress on the Standards.

Indicators 3m -3q:

3m. Materials provide strategies for gathering information about students' prior knowledge within and across grade levels/courses.

3n. Materials provide support for teachers to identify and address common student errors and misconceptions.

3o. Materials provide support for ongoing review and practice, with feedback, for students in learning both concepts and skills.

3p. Materials offer ongoing assessments:

- i. Assessments clearly denote which standards are being emphasized.
- ii. Assessments provide sufficient guidance to teachers for interpreting student performance and suggestions for follow-up.

3q. Materials encourage students to monitor their own progress.

Evidence Collection with Guiding Questions:

3m

Review the materials to see if they provide a clear path to assess and monitor students' prior knowledge both within and across grade levels/courses.

Review the materials to see if they offer supports that might be necessary to ensure students are able to meet the expectations of the grade level/course.

3n

Review the materials for highlighting common student errors or misconceptions.

Review the materials for providing pathways for addressing student errors and misconceptions.

Review the pathways for addressing students' errors and misconceptions for being mathematically sound (e.g. does not rely on "tricks").

Review the materials to see if they provide opportunities to have mathematical conversations to address errors and misconceptions.

3o

Review materials to see if they provide for ongoing review, practice, and feedback.

Review materials to see if feedback addresses both skills and concepts.

Review materials to see if the amount of ongoing review and practice is reasonable.

Review materials to see if there are there multiple strategies for providing feedback.

3pi

Review assessments to see if they clearly denote which standards are being assessed.

3pii

Review assessments to see if the provided guidance can be used to assess the full meaning of the Standards being assessed.

Review assessments to see if they provide sufficient guidance for the teacher to fully interpret student performance.

Review assessments to see if they provide follow-up steps/suggestions for the teacher.

Review assessments to see if provided guidance is easily understood.

3q

Review materials to see if/ how they encourage students to monitor their own progress.

Discussion Points for Cluster Meeting:

Preparing for discussion—questions to ask yourself:

3m

Where did I find examples to show assessment of prior knowledge?

Are there key topics missing from prior knowledge assessments?

3n

Where are examples that show common misconceptions or errors in students' work/understanding?

How do the materials provide opportunities for the teacher to address common errors or misconceptions?

Were there opportunities for mathematical discussions when an error or misconception was discovered?

Were there common misconceptions not addressed in the materials?

3o

Where did I find examples in the materials to show opportunities to provide productive feedback?

How do the materials provide opportunities for the teacher to provide quality feedback?

How do the materials address ongoing review and practice?

Were there opportunities for the teacher to use multiple strategies for providing feedback?

3pi

Where did I find examples in the materials to show how Standards were denoted on assessments?

3pii

Where did I find examples in the materials to show how provided guidance was used to score assessments?

Where did I find information on how to interpret the information gathered from provided guidance?

Were there suggestions for follow-up with students?

How can I show how I know the provided guidance can be easily understood and is specific enough to show true understanding and learning?

3o

What examples/strategies can I provide to show that the materials encourage students to monitor their own progress?

During discussion:

Explain the strategy/reasoning used as you collected evidence for this indicator.

Share any generalizations that you noted as you looked at materials over the course of the series, with specific examples (page numbers noted) to support the generalizations.

Scoring:

2 points:

3m

Materials include multiple opportunities for teachers to assess/apply students' prior knowledge and connect it to the new learning.

Students are appropriately monitored to assess key prior knowledge in order to continue with learning or to provide interventions.

3n

Materials include multiple opportunities for teachers to notice and correct errors or misconceptions.

Students are consistently monitored to assess common errors and misconceptions and provide interventions.

There are opportunities for mathematical discussions to help address common errors and misconceptions.

No major errors/misconceptions were left unaddressed.

3o

Materials include regular opportunities for teachers to provide the student with ongoing review and practice of both concepts and skills.

Materials include regular opportunities for the teacher to provide feedback.

Materials provide multiple feedback strategies.

Students are regularly monitored in order for the teacher to provide feedback.

3pi

Materials include denotations of the standards being assessed in assessments.

3pii

Materials include sufficient guidance for teachers.

Materials provide quality suggestions for follow-up.

Provided guidance can be used to assess the Standards to their full intent.

Quality guidance for the teacher to interpret assessment data is provided.

1 point:

3m

Attention to students' prior knowledge is included in some lessons/units/assessments, but connections to new learning are not made.

There is some opportunity for the teacher to apply prior knowledge to the students' new learning.

The lessons/units/assessments have some missed opportunities to remediate on errors in prior knowledge.

3n

Attention to common errors and misconceptions are included in some lessons/units/assessments, but a path for intervening is not provided.

There are some opportunities for the teacher to identify common errors and misconceptions.

There are some opportunities for mathematical discussions to address common errors and misconceptions.

The lessons/units/assessments have missed some opportunities to intervene where common errors or misconceptions occur.

The requirements outlined in Evidence Collection are met sometimes and/or not thoroughly.

3o

Attention to ongoing review and practice of concepts and skills is included in some lessons/units/assessments, but a path for productive feedback is not provided.

Attention to feedback is included in some lessons/units/assessments.

Feedback strategies are limited.

The lessons/units/assessments have missed some opportunities to provide feedback about concepts and skills, such as providing feedback only on skills but not concepts.

3pi

Standards are clearly denoted in some of the assessments.

3pii

Some guidance provided is too broad and could lead to multiple interpretations of the assessments.

Some guidance for follow-up suggestions is provided.

Some of the provided guidance can be used to assess the Standards to their full intent.

Some guidance for interpretation of assessment data is provided.

0 points:

3m

No/minimal opportunities for teachers to assess students' prior knowledge.

3n

No/minimal opportunities for teachers to identify students' common errors and misconceptions.

3o

No/minimal opportunities for teachers to provide ongoing review and practice or feedback.

3pi

No/minimal standards are denoted on assessments.

3pii

No/minimal guidance is provided.

No/minimal guidance for teachers to interpret assessment data and/or follow-up is provided.

Guidance provided is so vague or overly broad that it is not helpful.

Note: No score is given for indicator 3q (monitor own progress). Only qualitative evidence is provided.

Guidance for Indicator 3r-3y: Differentiated Instruction

Criterion: Materials support teachers in differentiating instruction for diverse learners within and across courses.

Indicators 3r - 3y:

3r. Materials provide teachers with strategies to help sequence or scaffold lessons so that the content is accessible to all learners.

3s. Materials provide teachers with strategies for meeting the needs of a range of learners.

3t. Materials embed tasks with multiple entry-points that can be solved using a variety of solution strategies or representations.

3u. Materials provide support, accommodations, and modifications for English Language Learners and other special populations that will support their regular and active participation in learning mathematics (e.g., modifying vocabulary words within word problems).

3v. Materials provide support for advanced students to investigate mathematics content at greater depth.

3w. Materials provide a balanced portrayal of various demographic and personal characteristics.

3x. Materials provide opportunities for teachers to use a variety of grouping strategies.

3y. Materials encourage teachers to draw upon home language and culture to facilitate learning.

Evidence Collection with Guiding Questions:

3r – 3t

Be specific about strategies or materials provided for differentiated instruction. There must be more than a statement at the beginning of the chapter or lesson that is generic or states that the same strategy could be used with every lesson.

Variance in presenting the lessons is noted as it would apply to meeting the needs of a range of learners.

Collect evidence of multiple entry points for lessons and/or specific problems with multiple entry points. Problems with multiple entry points are provided and balanced with problems with one solution or one entry point.

Collect evidence of problems with multiple solutions. Representations are provided for teachers and students.

3u

Include evidence of differentiation for all special populations (ELL, other special populations).

Materials should include specific strategies for support, accommodations, or modifications within the lesson or the problems.

Vocabulary or concepts may include scaffolding for teachers to present the materials.

3v

Collect examples of advanced students working at a greater depth with a standard—not just more problems or problems from higher-level courses.

Note any areas in the lessons or problems where advanced work is substituted for the on-course level work

3w – 3y

Collect examples of various demographic and personal characteristics throughout the chapters.

Provide examples of the grouping strategies and ways the materials provide for interaction among students.

Provide examples of home language connections and connections to culture of students to facilitate learning. This may be at the beginning of each chapter or throughout the materials.

Discussion Points for Cluster Meeting:

3r – 3t

How is the instruction differentiated, and what does it look like in lessons or in problems?

Review the teacher's guide, assessments, and other materials to find all possible places where instructional supports are noted.

What is the difference between materials that are provided specifically for differentiated instruction or the materials that are general notes about what "could be" implemented?

3u

What are the needs of special populations? How can problems be modified to ensure work is on course level but accessible to special populations of students?

What materials would help teachers provide lessons and concepts to help support these students?

3v

What are the needs of advanced populations of students?

How can on-course level concepts/problems be investigated at a greater depth and not replaced by above course-level work?

3w – 3y

How would the materials balance demographics and personal characteristics in the materials?

What grouping strategies would you expect to find in the materials?

How could materials balance whole group, small group, and individual instruction?

Do materials demonstrate home language connections and cultural connections?

Scoring:

2 points:

3r

The materials provide strategies or differentiation while maintaining rigor, coherence and focus.

3s

Specific strategies to meet the needs of all learners are included.

3t

The structure of lessons is flexible and balanced, and it would be easy to adjust the order or to scaffold presentation for learners.

Many examples of problems with multiple entry points and problems with multiple solutions or representations are present.

(Continued)

3u

Materials provide support for ELL students or other populations.

3v

Materials provide multiple opportunities for advanced students to investigate the course-level mathematics at a greater depth.

There are no instances of advanced students simply doing more problems than their classmates.

1 point:

3r

The materials provide some strategies or differentiation while maintaining rigor, coherence and focus.

Some general statements or strategies about differentiation are noted.

3s

Some general strategies to meet the needs of all learners are included.

3t

Rigid structure of lessons makes it difficult to adjust the order or to scaffold presentation for learners.

There are some examples of problems with multiple entry points or problems with multiple solutions or representations.

3u

Materials provide some support for ELL students or other populations.

Some general statements about ELL students are provided, or a few strategies are provided at the beginning of a chapter or at one place in the book.

(Continued)

3v

Materials provide some opportunities for advanced students to investigate the course-level mathematics at a greater depth.

Materials provide course level problems — problems are not at a greater depth for advanced students.

There are some instances of advanced students simply doing more problems than their classmates.

0 points:

3r

The materials do not provide for differentiated instruction.

The materials give lower course level lessons or provide the same strategy for each lesson.

3s

There are few, or no, general strategies to meet the needs of all learners included.

3t

Rigid structure of lessons prohibits adjusting the order or scaffolding presentation for learners.

There are few, or no, examples of multiple entry point problems or problems with multiple solutions or representations.

3u

Materials provide very little, if any, support for ELL students or other populations.

(Continued)

3v

Materials provide very few, if any, opportunities for advanced students to investigate the course-level mathematics at a greater depth.

There are many instances of advanced students simply doing more problems than their classmates.

Note: No score is given for indicators 3w (balanced portrayal), 3x (grouping strategies), and 3y (home language and culture). Only qualitative evidence is provided.

Guidance for Indicator 3z-3ad:

Effective Technology Use

Criterion: Materials support effective use of technology to enhance student learning. Digital materials are accessible and available in multiple platforms.

Indicators 3z - 3ad:
3z. Materials integrate technology such as interactive tools, virtual manipulatives/objects, and/or dynamic mathematics software in ways that engage students in the Mathematical Practices.
3z. Materials integrate technology such as interactive tools, virtual manipulatives/objects, and/or dynamic mathematics software in ways that engage students in the Mathematical Practices.
3ab. Materials include opportunities to assess student mathematical understandings and knowledge of procedural skills using technology.
3ac. Materials can be easily customized for individual learners.

i. Digital materials include opportunities for teachers to personalize learning for all students, using adaptive or other technological innovations.
ii. Materials can be easily customized for local use. For example, materials may provide a range of lessons to draw from on a topic.

3ad. Materials include or reference technology that provides opportunities for teachers and/or students to collaborate with each other (e.g. websites, discussion groups, webinars, etc.).

Evidence Collection with Guiding Questions:

3z

Are videos, virtual manipulatives, interactive tools, and/or games available to students?

How do any relevant materials engage students in “doing” math?

Determine alignment to the course-level content standards and Mathematical Practices.

3aa

Are any instructional technology resources web-based and compatible with multiple internet browsers?

Are materials accessible on both Windows and Apple platforms?

Do student resources (including assistive technology for students with disabilities) work on tablets and other mobile devices as well as PCs?

(Continued)

3ab

Determine if online assessments are available. Are these adaptive (questions change based on student answers) or fixed form (same questions for all students)?

Are teachers able to create their own assessments (i.e., selecting from a bank of items and/or objectives)?

Do assessment items assess both mathematical understanding and procedural skill/fluency? How?

3ac

Are teachers able to manipulate or construct learning experiences for students?

Can digital materials be differentiated based on individual students' needs?

Are teachers able to customize digital materials for local use (student and/or community interests)?

3ad

Do the digital materials provide opportunities for online collaboration? Is this collaboration between teacher and student? Or student to student? (i.e., discussion groups, webinars, e-mail, messaging)

Discussion Points for Cluster Meeting:

Be able to explain the strategy/reasoning used as you collected evidence for this indicator.

Be able to share any generalizations formulated while reviewing course-level materials, with specific examples (resources/page numbers noted) to support the generalizations.

Scoring:
Note: None of these indicators are scored. Only qualitative evidence is provided.