Standards-in-Action 2.0

State-Based Curriculum Review

Mathematical Progressions and Connections

Welcome!

Disclaimer

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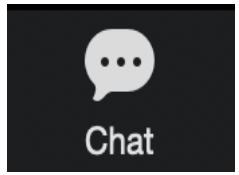
Let's Hear From You!



In the group chat, share your answer to this question:

- *CHAT: In a sentence, share any takeaways or challenges related to your experience reviewing your local curriculum for Dimension 1: Critical Mathematical Concepts and Skills?*

We'll ask everyone to hit "enter" at the same time so...

WAIT to hit "enter"!

Agenda

- Overview of Dimension 2 and its research base
- Introduction to the content criteria for Dimension 2
- Breakout work session #1 with your team
- Review of substantiations and rating of content criteria in the Example Workbook
- Introduction to the English learner (EL) support criteria for Dimension 2
- Breakout work session #2 with your team
- Review of substantiations and ratings of EL supports in the Example Workbook
- Next steps and final questions

Meeting Norms and Expectations

1. Be present and engage fully.
2. Ask questions.
3. Prepare for productive struggle.
4. Consider differing perspectives.
5. Create and maintain a safe space for professional learning.
6. Be mindful of different learning styles.

Research Base for Dimension 2

Research based on TIMSS (2019) and the ACT National Curriculum Survey (2016) shows that coherence:

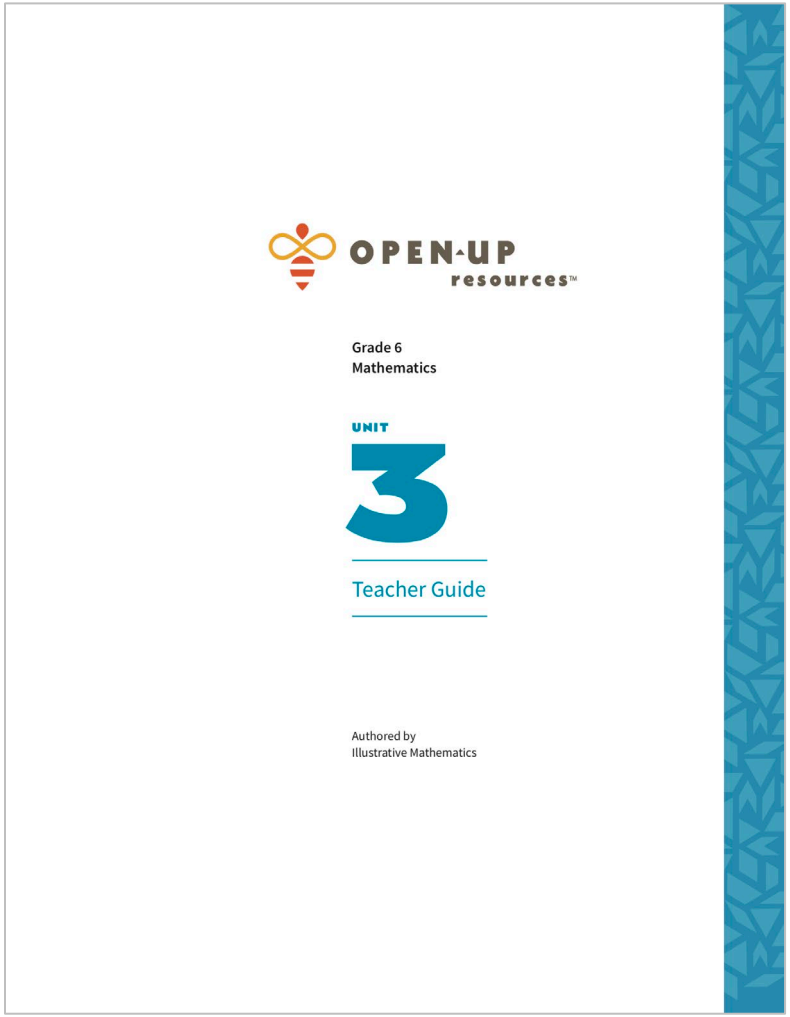
- Allows students to demonstrate new understanding built on foundations from the previous study.
- Prevents standards from being a list of isolated topics.
- Means that each standard is not a new event, but rather an extension of previous learning.

What Does Research on Progressions Mean for High-Quality Curriculum?

It means:

- Content will unfold meaningfully for students.
- Students will be asked to apply their prior knowledge to new knowledge.
- Students will expect knowledge and skills to build and grow.
- Mathematics will become more than a collection of disparate skills and concepts.

Illustrative Mathematics



Illustrative Mathematics

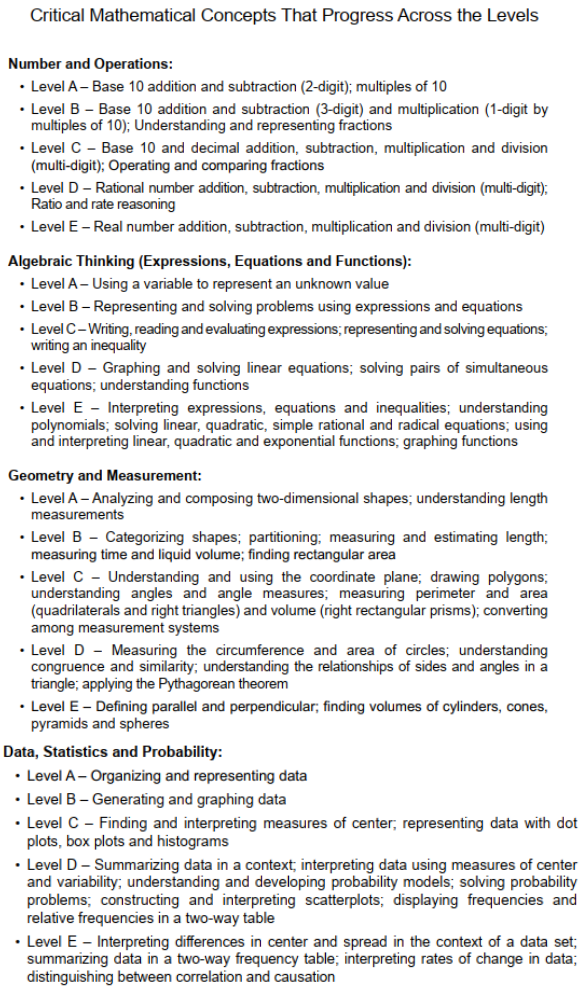
Critical Mathematical Concepts That Progress Across the Levels

Number and Operations >

Algebraic Thinking >

Geometry and Measurement >

Data, Statistics and Probability >



Critical Mathematical Concepts That Progress Across the Levels

Number and Operations:

- Level A – Base 10 addition and subtraction (2-digit); multiples of 10
- Level B – Base 10 addition and subtraction (3-digit) and multiplication (1-digit by multiples of 10); Understanding and representing fractions
- Level C – Base 10 and decimal addition, subtraction, multiplication and division (multi-digit); Operating and comparing fractions
- Level D – Rational number addition, subtraction, multiplication and division (multi-digit); Ratio and rate reasoning
- Level E – Real number addition, subtraction, multiplication and division (multi-digit)

Algebraic Thinking (Expressions, Equations and Functions):

- Level A – Using a variable to represent an unknown value
- Level B – Representing and solving problems using expressions and equations
- Level C – Writing, reading and evaluating expressions; representing and solving equations; writing an inequality
- Level D – Graphing and solving linear equations; solving pairs of simultaneous equations; understanding functions
- Level E – Interpreting expressions, equations and inequalities; understanding polynomials; solving linear, quadratic, simple rational and radical equations; using and interpreting linear, quadratic and exponential functions; graphing functions

Geometry and Measurement:

- Level A – Analyzing and composing two-dimensional shapes; understanding length measurements
- Level B – Categorizing shapes; partitioning; measuring and estimating length; measuring time and liquid volume; finding rectangular area
- Level C – Understanding and using the coordinate plane; drawing polygons; understanding angles and angle measures; measuring perimeter and area (quadrilaterals and right triangles) and volume (right rectangular prisms); converting among measurement systems
- Level D – Measuring the circumference and area of circles; understanding congruence and similarity; understanding the relationships of sides and angles in a triangle; applying the Pythagorean theorem
- Level E – Defining parallel and perpendicular; finding volumes of cylinders, cones, pyramids and spheres

Data, Statistics and Probability:

- Level A – Organizing and representing data
- Level B – Generating and graphing data
- Level C – Finding and interpreting measures of center; representing data with dot plots, box plots and histograms
- Level D – Summarizing data in a context; interpreting data using measures of center and variability; understanding and developing probability models; solving probability problems; constructing and interpreting scatterplots; displaying frequencies and relative frequencies in a two-way table
- Level E – Interpreting differences in center and spread in the context of a data set; summarizing data in a two-way frequency table; interpreting rates of change in data; distinguishing between correlation and causation

Dimension 2: Logical Mathematical Progressions and Connections

Dimension 2
Mathematical Progressions and Connections

Review Content Criteria for Dimension 2: *Note criteria with asterisks (*) for EL support.*

1 ____ **Content Criterion.** Curriculum explains ways for teachers and students to connect concepts level-to-level.

- Does the curriculum make explicit connections between the critical concepts of the level and those of future levels? For the teacher? For the student?
- Does the curriculum identify prerequisite knowledge that students will need in order to do the level-specific work?

Substantiation:

2 ____ **Content Criterion.** Curriculum explains ways for teachers and students to connect concepts within the level. *

- Does the curriculum clarify the connections among the critical concepts within the level? For the teacher? For the student?
- Are teachers encouraged to introduce new concepts by connecting to what students already know?
- Does content build on understanding from previous lessons, as evidenced in the table of contents or sequence of lessons?

Substantiation:

3 ____ **Content Criterion.** Curriculum devotes most attention to on-level content. Mathematics from previous levels is identified and does not interfere unduly with on-level content.

- Is mathematics content from previous levels clearly identified as "review"?
- Is the number of "review" lessons a small enough percentage of the whole so as not to distract from on-level content?
- Is the time spent reviewing past concepts purposeful and helpful, and does it support a deeper understanding of on-level content?

Substantiation:

Dimension 2: Rating for Content Alignment

_____ 2 Most or all components of the content criteria are present

_____ 1 Some components of the content criteria are present

_____ 0 Few or no components of the content criteria are present

Summary Comments:

Review EL Supports for Dimension 2:

1 ____ **EL Support**. Curriculum relates new mathematical vocabulary to knowledge students already have.

Substantiation:

Dimension 2: Rating for EL Supports *(include starred Content Criteria #2 in your rating)*

___2 Most or all components of the EL supports are present

___1 Some components of the EL supports are present

___0 Few or no components of the EL supports are present

Summary Comments:

Content Alignment Criteria

Dimension 2: Content Criterion 1

Curriculum explains ways for teachers and students to connect concepts level-to-level.

Ask Yourself:

- *Does the curriculum make explicit connections between the critical concepts of the level and those of future levels? For the teacher? For the student?*

- *Does the curriculum identify prerequisite knowledge that students will need in order to do the level-specific work?*

Dimension 2: Content Criterion 2

Curriculum explains ways for teachers and students to connect concepts within the level.*

Ask Yourself:

- *Does the curriculum clarify the connections among the critical concepts within the level? For the teacher? For the student?*
- *Are teachers encouraged to introduce new concepts by connecting to what students already know?*
- *Does content build on understanding from previous lessons, as evidenced in the table of contents or sequence of lessons?*

Dimension 2: Content Criterion 3

Curriculum devotes most attention to on-level content. Mathematics from previous levels is identified and does not interfere unduly with on-level content.

Ask Yourself:

- *Is mathematics content from previous levels clearly identified as "review"?*
- *Is the number of "review" lessons a small enough percentage of the whole so as not to distract from on-level content?*
- *Is the time spent reviewing past concepts purposeful and helpful, and does it support a deeper understanding of on-level content?*

Rating for Content Alignment

2 Points: Most or all components of the content criteria are present.

1 Point: Some components of the content criteria are present.

0 Points: Few or no components of the content criteria are present.

Breakout Time: 30 minutes

Your turn to work with your team:

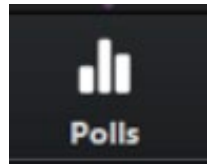
- Examine the evidence in the curriculum for each of these content criteria for Dimension 2.
- Check the content criteria that are evident and cite where you found evidence in your notes.
- Discuss the evidence you found for all the content criteria with your team and agree upon a rating for the dimension.
- When we reconvene, we will ask you to share comparisons of your rating, criteria checks, substantiations, and commentary.

Breakout Materials

- Your copy of the Participant Workbook (p. 5)
- Curriculum: Illustrative Mathematics:
  - Grades 6, 7, and 8 Course Guides
  - Grade 6, Unit 3 Course Guide
- Resource: Critical Concepts and Fluencies of the Level
- Resource: Critical Mathematical Concepts That Progress Across the Levels

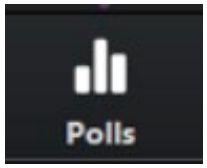
Welcome Back!

Let's Hear From You!



- POLL: What is your rating for **Dimension 2 Content Alignment**?
  - 2 points: Most or all components of the content criteria are present.
  - 1 point: Some components of the content criteria are present.
  - 0 points: Few or no components of the content criteria are present.

Let's Hear From You!

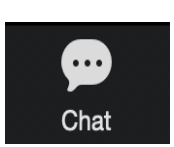


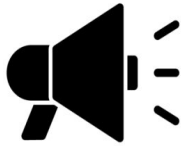
- POLL: Did you check (as present) the same criteria as in the Example Workbook?

  O Yes, I checked the same criteria as the example.

  O No, I checked one or more criteria differently than the example.

Let's Discuss!





- Let's take 5 minutes to review the Example Workbook that contains the substantiations for the content criteria.
- Then in the group chat, share your answer to this question:
  - *CHAT: How do your substantiations compare to the example?*

Now let's hear from some of you about the evidence you found and noted in your Summary Comments.

EL Support Criteria

Dimension 2: EL Support Criterion

(1) Curriculum relates new mathematical vocabulary to the knowledge students already have.

Rating for EL Supports

2 Points: Most or all components of the EL supports are present.

1 Point: Some components of the EL supports are present.

0 Points: Few or no components of the EL supports are present.

Breakout Time: 20 minutes

- Scan the curriculum for evidence of the EL supports.
- Discuss with your team and agree on whether there is evidence in the curriculum for that EL support criterion.
- Check if you find evidence and determine the “weight” of the missing supports or parts of supports.
- Make notes about your findings.
- Together, assign a rating for the dimension’s EL supports. (Include the asterisked content criterion #2.)
- When we reconvene, we will ask you to share comparisons of your rating, criteria checks, substantiations, and commentary.

Breakout Materials

- Your copy of the Participant Workbook (p. 6)
- Curriculum: Illustrative Mathematics:
  - Grades 6, 7, and 8 Course Guides
  - Grade 6, Unit 3 Teacher Guide
- Resource: Critical Concepts and Fluencies of the Level
- Resource: Critical Mathematical Concepts That Progress Across the Levels

Welcome Back!

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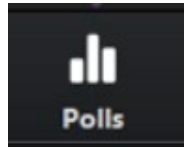
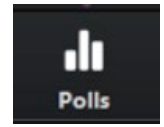


- POLL: What is your overall rating for **Dimension 2 EL Supports**?
  - 2 points: Most or all components of the criteria are present.
  - 1 point: Some components of the criteria are present.
  - 0 points: Few or no components of the criteria are present.

Let's Hear From You!

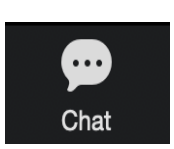


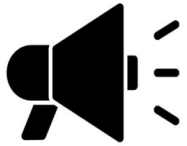
- POLL: Did you check (as present) the same criteria as in the Example Workbook?

  O Yes, I checked the same criteria as the example.

  O No, I checked one or more criteria differently than the example.

Let's Discuss!





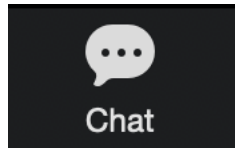
Let's take 5 minutes to review the Example Workbook that contains the substantiations for the EL support criteria.

Then in the group chat, share your answer to these questions one at a time:

- *CHAT: How do your substantiations compare to the example?*

Now let's hear from some of you about the evidence you found and noted in your Summary Comments.

Let's Chat!



In the group chat, share your answer to this question in a sentence or two:

- *CHAT: What is something you have learned today (or better understand) regarding the importance of mathematical connections and progressions for all students?*

We'll ask everyone to hit "enter" at the same time so…

WAIT to hit "enter"!

Next Steps

- We will focus on content criteria for **Dimension 3** to:
  - Assess the sample curriculum from Illustrative Mathematics for its inclusion of reasoning with mathematics.

Thank you!