# The Intersection of Equity and Math

UnboundEd
Virtual Summit Day 1
Grades 6-12
Summer 2020



1

## UnboundEd Vision

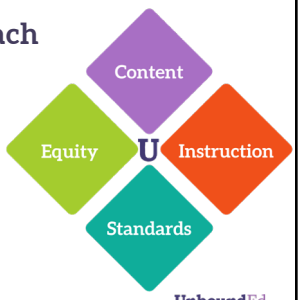
Education systems disrupt systemic racism by providing students of color meaningful, engaging, and affirming grade-level instruction.



2

## UnboundEd Approach

Our learning is grounded in the intersection of the standards, content, aligned curriculum, and the equitable instructional practices that are essential for closing the opportunity gap caused by systemic bias and racism.






3

## By the end of this session

**01** **Examine**
the effects of teacher choices on math instruction.

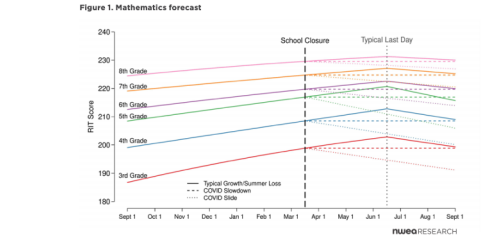
**02** **Identify**
the impact of unconscious bias on access to grade-level math content for students of color.

**03** **Consider**
instructional decisions to help students access grade-level math content during and after the COVID-19 pandemic.



4

## The COVID-19 Slide

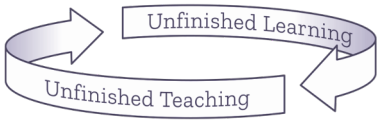



Source: "The COVID-19 Slide," by Megan Kuhfeld and Beth Tarasawa, 2020, NWEA.org.



5

## Defining Unfinished Instruction




Grade level standards and concepts that were not directly taught nor assessed prior to students entering the next grade.

Grade level standards and concepts that students did not demonstrate proficiency in prior to entering the next grade.



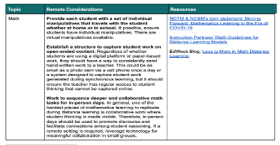
6

## Math Distance Learning

CCSSO
Council of Chief State School Officers

**RESTART & RECOVERY: CONSIDERATIONS FOR TEACHING AND LEARNING: ACADEMICS**

Appendix D: Remote Learning Instructional Considerations



Source: "Restart & Recovery," by Council of Chief State School Officers, 2020, www.ccsso.org/coronavirus.

@unboundedu

UnboundEd

7

## Unconscious Bias

refers to the **automatic** and **unconscious** stereotypes that drive people to **behave** and make decisions in certain ways. It is the mind's way of making uncontrolled and **automatic associations** between two concepts very quickly.


@unboundedu



8

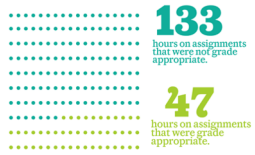
## What conclusions can you draw from these three stats?

Teacher expectations for student success against grade-level standards.

**82%** of teachers supported the content of their state's academic standards.

**44%** of teachers expected their students could have success with the standards.

Of the 180 classroom hours in each core subject during the school year, students spent:



**133** hours on assignments that were not grade appropriate.

**47** hours on assignments that were grade appropriate.

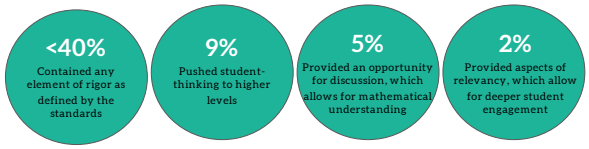
Source: "The Opportunity Myth" by TNTP, 2018.

@unboundedu

UnboundEd

9

## A recent review of >1,800 middle-grade math assignments found:




Source: "Checking In: Are Math Assignments Measuring Up?" by The Education Trust, 2018.

@unboundedu

UnboundEd

10

## When looking at segregated classrooms

**Classrooms with mostly white students tended to have...**


**...compared to classrooms with mostly students of color**

Source: "The Opportunity Myth" by TNTP, 2018.

@unboundedu

UnboundEd

11

## The Shifts

| | |
|---|---|
| **1. Focus** | **Focus** strongly where the Standards focus. |
| **2. Coherence** | **Think** across grades, and link to major topics within grades. |
| **3. Rigor** | Pursue **conceptual understanding**, **procedural skill** and **fluency**, and **application** with equal intensity. |

Source: "The Shifts," by Student Achievement Partners, https://achievethecore.org/category/419/the-shifts.

@unboundedu

UnboundEd

12

FOCUS

## Review: 6.RP.A ← Domain

Grade level → Grade 6 >> Ratios & Proportional Relationships

Cluster → Understand ratio concepts and use ratio reasoning to solve problems.

Standard →

CCSS.MATH.CONTENT.6.RP.A.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

CCSS.MATH.CONTENT.6.RP.A.2

Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]

Source: "Common Core State Standards," National Governors Association Center for Best Practices, 2010, Corestandards.org.

@unbounded

UnboundEd

13

FOCUS

## Reading the Code: F-IF.A ← Domain

Conceptual Category → High School: Functions » Interpreting Functions

Cluster → Understand the concept of a function and use function notation.

Standard →

CCSS.MATH.CONTENT.HSF.IF.A.1

Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).

CCSS.MATH.CONTENT.HSF.IF.A.2

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Source: "Common Core State Standards," National Governors Association Center for Best Practices, 2010, Corestandards.org.

@unbounded

UnboundEd

14

## The Mathematical Shifts: Focus by Grade-level

Some clusters require greater emphasis, due to:

- the depth of the ideas.
- the time required to master.
- their importance to understanding future math.
- the need to meet the Standards for Mathematical Practice.

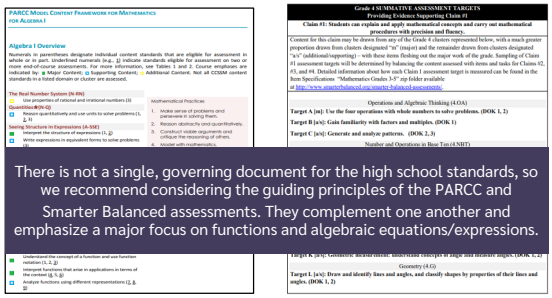
- Major clusters are the highest priority.
- Supporting clusters are designed to support and strengthen areas of major emphasis.
- Additional clusters may not connect tightly or explicitly to the major work.

Source: "Focus" Documents, by Student Achievement Partners, achievethecore.org.

@unbounded

UnboundEd

15



PARCC Model Content Frameworks for Mathematics for Algebra I

Algebra I Overview

Grade 4 Summative Assessment Targets Providing Evidence Supporting Claim #1

Claim #1: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

There is not a single, governing document for the high school standards, so we recommend considering the guiding principles of the PARCC and Smarter Balanced assessments. They complement one another and emphasize a major focus on functions and algebraic equations/expressions.

@unbounded



UnboundEd

16

## Focus and Equity

Thinking of the next school year, how can using the shift of focus help you prioritize your content?

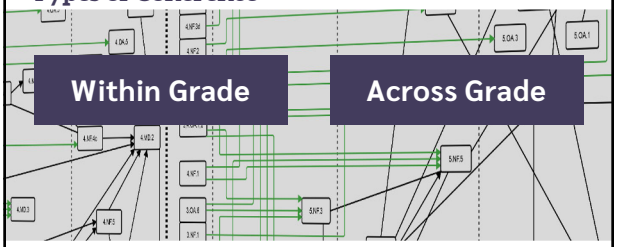
@unbounded



UnboundEd

17

## Types of Coherence



Within Grade

Across Grade

Source: "Coherence Map," by Student Achievement Partners, achievethecore.org.

18

## Within-Grade Coherence

Access Exercise 1 from the lesson found at https://www.unbounded.org/math/grade-6/module-5/topic-d/lesson-14 and "do the math." What do you notice?

6.G.A.2: Find the **volume** of a right rectangular pri... fractional edge lengths... Apply the formulas ... *Bh* to find volumes of right rectangular prism... edge lengths in the context of solving real... mathematical problems.

Supporting

6.EE.B.7: Solve ... and mathematical problems by **writing and solvi...** ... the form $x + p = q$ and $px = q$ for cases in which ... all nonnegative rational numbers.

Major

6.NS.A.1: Interpret and compute **quotients of fractions**... word problems involving division of fractions by fra... using visual fraction models and equations to ... problem...

Major

Source: "Common Core State Standards," National Governors Association Center for Best Practices, 2010, Corestandards.org.

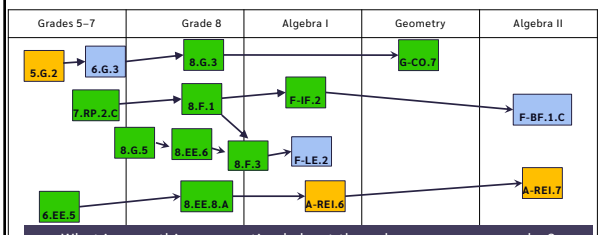
@unboundedu

UnboundEd

19

## Coherence Across Grades and Courses

Major Supporting Additional




What is something you noticed about the coherence across grades?

@unboundedu



UnboundEd

20

## Coherence and Equity

Thinking of the next school year, how can using the shift of coherence help give access to grade-level work?

@unboundedu



UnboundEd

21

## Rigor Unpacked

"Rigor refers to deep, authentic command of mathematical concepts, not making math harder or introducing topics at earlier grades."


Source: "The Shifts," by Student Achievement Partners, https://achievethecore.org/category/419/the-shifts.

@unboundedu

UnboundEd

22

## Rigor Unpacked

| Conceptual Understanding | Procedural skills and Fluency | Application |
|---|---|---|
| • Higher order thinking skills<br>• Multiple representations<br>• Beyond performing procedures | • Accurately performing core functions<br>• Efficiency | • Problem-solving<br>• Real-world or mathematical contexts |

@unboundedu



UnboundEd

23

## Rigor and Equity

Thinking of our current virtual situation, how should attending to the shift of rigor influence your task selection?

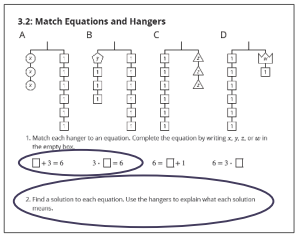
@unboundedu

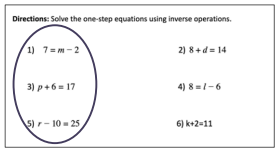


UnboundEd

24

## Let's Do Some Math!




1. Do the math for the circled problems.
2. Compare and contrast the two tasks
3. Which would you typically assign to students?
4. What drives that instructional decision?

Source: Available at IllustrativeMathematics.org. Licensed by Illustrative Mathematics under CC-BY.

@unboundedu

UnboundEd

25

## Application in Instruction

### 14.3: Comparing Reading Rates

- Lin read the first 54 pages from a 270-page book in the last 3 days.
- Diego read the first 100 pages from a 320-page book in the last 4 days.
- Elena read the first 160 pages from a 480-page book in the last 5 days.

If they continue to read every day at these rates, who will finish first, second, and third? Explain or show your reasoning.

6.RP.A.3
Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

Source: Available at IllustrativeMathematics.org. Licensed by Illustrative Mathematics under CC-BY.

@unboundedu

UnboundEd

26

## Leveraging the *Shifts* to Maintain Equitable Access to Grade-level Content

**Focus** strongly where the Standards focus.

**Coherence**: Think **across grades**, and link to major topics **within grades**.

Rigor in major topics: Pursue **conceptual understanding, procedural skill and fluency**, and **application** with equal intensity.

The shifts can:

- help us better understand the standards.
- challenge deficit views by giving students access to grade-level work.
- promote deeper understanding of content.
- help us understand how to adapt our resources and instruction.
- move us toward ensuring our students have equitable access to grade-level content.

@unboundedu

Source: "Common Core State Standards," National Governors Association Center for Best Practices, 2010, Corestandards.org.

UnboundEd

27

## The Intersection of Equity and Unfinished Math Instruction

UnboundEd
Virtual Summit Day 2
Grades 6-12
Summer 2020

@unboundedu



UnboundEd

28

## By the end of this session

**01** **Identify**
the difference between instructional supports and modifications.

**02** **Leverage**
the mathematical shifts to provide grade-level content.

**03** **Plan**
an approach for accelerating students who experienced unfinished instruction.

@unboundedu



UnboundEd

29

## Patterns of Behavior We've Seen

### "Sticking to the Script"

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|

@unboundedu

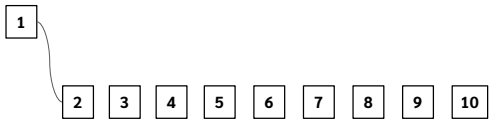


UnboundEd

30

## Patterns of Behavior We've Seen

"Gutting the Grade-level Learning"



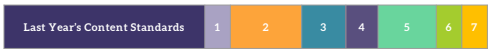



31

## Patterns of Behavior We've Seen

Grade-Level Scope and Sequence


Blanket Review






32

## Coherent Content in Context

- Students learn math when it is based on the math they already know.
- All students **can** be successful with grade-level math.



33

This daily re-engagement of prior knowledge in the context of grade-level assignments will add up over time, resulting in more functional learning than if we resort to watered down instruction or try to reteach topics out of context.

Source: "Addressing Unfinished Learning After COVID-19 School Closures," by the Council of Great City Schools, 2020, cgcs.org.



34

## Levels of Planning

- Yearly Planning
- Unit Planning
- Daily Lesson Planning



35

## Step One

Do the Work of the Lesson



36

## Standards & Learning Targets

**Standards:**
**A-CED.A.2:** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

**A-CED.A.3:** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

**HSN-Q.A.2:** Define appropriate quantities for the purpose of descriptive modeling.

**Learning Targets:**
- Comprehend the term "constraint" to mean a limitation on the possible or reasonable values a quantity could have.
- Use variables and the symbols =, <, and > to represent simple constraints in a situation.
- Write expressions with numbers and letters to represent the quantities in a situation.

Source: Available at IllustrativeMathematics.org. Licensed by Illustrative Mathematics under CC-BY.



37

## Exit Ticket

**Continue to examine Lesson 1 from Unit 2:**

**Directions:**
1. **Do the exit ticket problem.**
2. **How does this problem relate to the expectations of A-CED.A.2?**

Source: Available at IllustrativeMathematics.org. Licensed by Illustrative Mathematics under CC-BY.



38

## Your Turn to Practice

Complete the Activity 1.2

39

# Step Two

## Prioritize the Most Critical Prerequisites and Key Knowledge

40

## Identify Prerequisites and Key Knowledge

- Use the coherence map and lesson guidance to identify prerequisite standards.
- Determine which one support the grade-level standards the best, and also note when it would have been taught in the previous grade.

41

## Your Turn to Practice

**Discussion:** Consider what students will need to know to access this lesson. Which of these standards could provide a connection to grade-level learning?

42

# Step Three

Formatively assess prerequisite skills/knowledge



43

## Formative Assessment Characteristics

| Assessment designed to support and be integrated with recommended approach to curriculum and instruction | |
|---|---|
| **Has These Characteristics** | **Does Not Have These Characteristics** |
| Integrated with model of curriculum and instruction that moves students to learning essential on-grade content as quickly as possible | Assessed in a model that the entire or substantial portions of the previous set of content standards and/or curriculum be re-taught prior to going on to the fall 2020 on-grade content<br>- Informs an extensive "remediation first" instructional strategy |
| Administered "just in time" | Assess once for the entire year at the beginning of the year |
| Thin and lean: focused on the essentials of the on-grade content to be learned and coordinated with the on-grade curriculum | Take place in a survey assessment covering the previous year's entire set of content standards |
| Largely formative in nature, administered by and for the teacher | Largely summative in nature, e.g., standardization, external control |
| Be designed to yield information about student knowledge and performance in primarily content-specific ways | Designed with summative uses prioritized, e.g., yields a scale score, supports comparability, unidimensional construct |
| Coordinated with additional assessments during the course of instruction | Free-standing |

Source: "Back to School Assessment," by Brian Gong, 2020, Center for Assessment.

In the chat:

What would be the benefits of using these types of assessments?



44

## Selecting Formative Assessment Tasks

Where do I get aligned assessment questions?

- Exit tickets
- Assessments for prerequisite standards
- Coherence Map

How many questions do I need to assess prerequisite?

- Quality over quantity



45

# Step Four

Design or Identify Curricular Supports



46

## Coherent Content in Context

- Coherent in the progression of grade-level learning
- Focused on current grade-level content
- Relatively quick



47

## Selecting Tasks for Supports

**Where do I get aligned tasks?**

- Exit tickets
- Formative assessments
- SAP's Coherence Map
- Lessons from an aligned curriculum



48

## Publisher Resources

COLLABORATIVE FOR STUDENT SUCCESS

### Publisher Information

To support school systems and educators in meeting the learning needs of students in a drastically altered context, whether that be in-person, online, or a hybrid of the two, The Collaborative for Student Success is reaching out to the highest rated curriculum publishers (defined by a "green" rating by EdReports) to compile the adjustments they'll be making for the 2020/2021 school year. As district leaders focus on prioritizing instructional materials that focus on grade-level content and rigor, address learning gaps within the context of grade-level work, and create plans to adapt instruction, this resources is intended to offer clarity around what areas have and will be addressed by publishers.

Source: "Curriculum Publisher Information to Support Learning during COVID," by the Collaborative for Student Success, 2020, https://forstudentsuccess.org/our-campaigns/reopening-schools/

@unboundedu UnboundEd

49

## Justice is found in the details of teaching and learning.™

@unboundedu  UnboundEd

50

## For More Resources

Visit UnboundEd.org


Math Content Guides


ELA Fluency Guides


Blogs


Podcasts


Bias Toolkit


Free Lessons


Classroom Videos

@unboundedu  UnboundEd

51

## Host the learning in your school, district, or organization


Virtual keynote speakers


Virtual Summits

**Visit UnboundEd.org/VirtualSummit**

@unboundedu  UnboundEd

52

## Thank you!

- unbounded.org
- /unboundedu
- @unboundedu
- /unboundedu
- /company/unbounded.org

@unboundedu  UnboundEd

53

## About This Deck

- Copyright © 2020 UnboundEd Learning, Inc.
- This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.
- UnboundEd Learning, Inc. is the copyright holder of the images and content, except where otherwise indicated.
- More information on Creative Commons' licenses can be found here: https://creativecommons.org/licenses/.

@unboundedu  UnboundEd

54

## How You Can Use This Deck

The materials that we create, unless otherwise cited, are licensed under the Creative Commons Attribution-NonCommercial-ShareAlike-NoDerivatives 4.0 International license (CC BY-NC-ND 4.0). This means you may:

- **Share**—copy and redistribute the material in any medium or format

As long as you follow the license terms:

- **Provide Attribution**—You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests that UnboundEd or any third party creator endorses you or your use.
- **No Commercial Use**—You may not use the material for commercial purposes.
- **No Derivatives**—If you remix, transform, or build upon the material, you may not distribute the modified material.
- **No Additional Restrictions**—You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



55