



Essential Characteristics of Math Curriculum Materials That Advance Culturally Responsive and Sustaining Education

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This document identifies five research- and evidence-based essential characteristics of math curriculum materials that advance culturally responsive and sustaining education (CRSE), as well as resources aimed at supporting implementation of CRSE in math and across other content areas.

This document is designed as a reference guide for people interested in ensuring math curriculum materials are culturally responsive and sustaining. It can be used by curriculum developers, curriculum publishers, state education agencies, district leaders, school leaders, classroom teachers, and others to help them develop and select curricular materials that are culturally responsive and sustaining. The resources listed in this guide may also be useful for educator preparation and professional learning to strengthen educators' CRSE-related knowledge, skills, and practices.

What Is Culturally Responsive and Sustaining Education?

CRSE is an approach to education that seeks to advance educational equity by creating culturally affirming and inclusive learning environments, experiences, and outcomes for each student. CRSE recognizes cultural differences (including racial, ethnic, linguistic,

gender, sexuality, and ability differences) as assets for teaching and learning and as capital, or knowledge, that can be leveraged in classrooms, schools, and districts to support students' development of positive identities and academic and social and emotional learning.

CRSE is informed by a constantly evolving cross-section of research and fields of study, including culturally relevant pedagogy, culturally responsive teaching, racial identity development, bilingualism, student agency, critical race theory, and social and emotional learning. At its heart, CRSE involves making substantive connections between students' cultural identities and lived experiences and the content and skills that they learn in school as ways that support cultural pluralism, not cultural assimilation.¹

Organization of the Document

The document begins with descriptions of the five essential characteristics that enable math curriculum materials to be useful to well-prepared and skilled teachers to advance CRSE in math classrooms. Next, it presents a table outlining resources to use for implementing these essential characteristics throughout all content areas.

¹New York State Education Department. (2018). Culturally Responsive-Sustaining Education Framework. <http://www.nysed.gov/common/nysed/files/programs/crs/culturally-responsive-sustaining-education-framework.pdf>

Five Essential Characteristics and Their Core Features



Essential characteristic 1: Affirms racial and cultural identities

Math curricula affirm the cultures, languages, and identities of all students and community members.

Core features:

- » Curriculum materials value student, family, and community cultural and linguistic practices and are used as vehicles for acquiring and demonstrating knowledge and skills.²
- » Students' and families' racial and other identities are reflected and validated in all materials.
- » Curriculum materials consist of accurate portrayals of all cultures and identities and are free of all forms of bias and stereotypes.



Essential characteristic 2: Cultivates agency and belonging

Math curricula support the cultivation of a community of learners and build student agency.

Core features:

- » Curriculum materials consist of open-ended problem-posing structures to normalize centering students' individual and collective expertise in an authentic and meaningful way.
- » Curriculum materials cultivate a community of learners in a way that builds students' ability to connect across cultures and identities.
- » Curriculum materials include approaches and strategies that leverage and grow students' social and emotional competencies.



Essential characteristic 3: Builds critical consciousness

Math curricula build student capacity to understand and address historical and contemporary injustice.

Core features:

- » Curriculum materials provide opportunities to acquire and apply mathematical skills and concepts to further students' understanding of the relationships between race, culture, identity, power, and privilege and the historical and current systems that create and sustain inequality.
- » Students learn mathematical concepts and apply critical thinking practices to connect them to real world situations at the local, national, and global levels.
- » Curriculum materials prompt students to take collective action to address local, national, or global issues of injustice

² New York State Education Department. (2018). Culturally Responsive-Sustaining Education Framework. <http://www.nysed.gov/common/nysed/files/programs/crs/culturally-responsive-sustaining-education-framework.pdf>



Essential characteristic 4: Centers diverse perspectives

Math curricula challenge dominant narratives about math and school, elevating historically marginalized voices.

Core features:

- » Students learn about the histories, lived experiences, and world views of people who have been historically excluded from dominant narratives about mathematics and schooling.
- » Curriculum materials challenge traditional ways of knowing/doing math (e.g., right/wrong binary, base-10, emphasis on individual achievement) by providing students opportunities for open-ended problem-solving, social connection, and connecting math to their context.
- » Curriculum materials provide prompts, supports, and resources for teachers to validate student and community mathematical assets.



Essential characteristic 5: Centers student learning and academic success

Math curricula hold high expectations for student learning, supporting the development of positive math identities.

Core features:

- » Curriculum materials are aligned with relevant state and/or national standards and ensure that students will acquire the knowledge and skills needed for academic success.
- » Students have multiple, diverse opportunities to display and communicate their thinking.
- » Students have the opportunity to reason, problem-solve, and make real world connections.
- » Students are encouraged to talk about their learning and provided with effective scaffolds.
- » Curriculum materials provide opportunities to validate students' effort, not just ability.
- » Curriculum materials encourage student questioning and ownership of their learning.

Implementing the Five Essential Characteristics

The resources below can support state and local leaders, teachers, families, and students across multiple grade levels in implementing the essential characteristics outlined above. They have been compiled to support educators at multiple points in the process of creating, adopting, implementing, and evaluating mathematics curriculum. As such, the list includes guides, curricular resource lists, curriculum evaluation and analysis tools, lesson plans, professional learning resources, and supplemental curricular resources. These resources each show evidence of addressing at least three of the essential characteristics.

Table 1. Resources to Support Implementation of the Essential Characteristics of Math Curriculum Materials That Advance Culturally Responsive and Sustaining Education

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
<i>The Mississippi Cultural Responsivity Matrix: A Teachers' Self-study Guide for Culturally Responsive Practices in Grades K-6: Reading and Mathematics</i> The National Center for Culturally Responsive Educational Systems 2006	Curriculum and Pedagogy	K-6	Curriculum Analysis Tool	Teachers, Administrators	✓	✓	✓	✓	✓
<i>Knowing and Valuing Every Learner: Culturally Responsive Mathematics Teaching</i> Mark Ellis, PhD, Curriculum Associates 2019	Pedagogy	All	Guide	Teachers	✓	✓	✓	✓	✓

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
<i>The Culturally Responsive-Sustaining STEAM Curriculum Scorecard</i> NYU Metro Center EJ-ROC Leah Q. Peoples, Tahia Islam, and Timothy Davis 2021	Curriculum and Pedagogy	All	Curriculum Analysis Tool	Families, Teachers, Administrators, Students, Community Members	✓	✓	✓	✓	✓
<i>A Pathway to Equitable Math Instruction</i> Collaborators/Authors 2021	Curriculum and Pedagogy	6-8	Tools, Guides, Professional Learning Resources	Teachers, District/School Leaders, Coaches	✓	✓	✓	✓	✓
<i>The Mo(ve)ment to Prioritize Antiracist Mathematics: Planning for This and Every School Year</i> TODOS Mathematics for All; Maria del Rosario Zavala, Ma Bernadette Andres-Salgarino, Zandra de Araujo, Amber G. Candela, Gladys Krause, and Erin Sylves 2020	Curriculum and Pedagogy	All	Position Statement, Brief, Resource Lists	Families, Teachers, Administrators, Students, Community Members	✓	✓	✓	✓	✓

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
<u>Culturally Responsive Mathematics Teaching—TM Lesson Analysis Tool</u> TODOS Mathematics for All N.D.	Curriculum and Pedagogy	All	Lesson Analysis Tool	Teachers, Coaches	✓	✓	✓	✓	✓
<u>Math in a Cultural Context</u> University of Alaska Fairbanks 2019	Curriculum	1-7	Supplemental Curriculum	Teachers	✓			✓	✓
<u>Mathematics: Spotlight on Equity Resources</u> Vermont Agency of Education 2022	Curriculum and Pedagogy	All	Resource List	Teachers, District/School Leaders, Coaches	✓	✓	✓	✓	✓
<u>Equitable Mathematics Teaching Practices Proficiency Scales</u> Vermont Agency of Education 2019	Curriculum and Pedagogy	All	Tool/Rubric	Teachers, Coaches	✓	✓	✓	✓	✓

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
Free reproducibles from NCSM Essential Actions: Culturally Relevant Leadership in Mathematics Education Leadership in Mathematics Education, Mona Toncheff 2020	Curriculum and Pedagogy	All	Reproducibles	District/School Leaders, Teachers, Coaches	✓	✓		✓	✓
Culturally Responsive Math Guide Almost Fun 2020	Curriculum and Pedagogy	K-8	Lesson Examples, Lesson Rubric	District/School Leaders, Teachers, Coaches	✓	✓		✓	✓

Additional CRSE Resources to Support Implementation Across Content Areas

The resources in the table below are intended to be used to support building awareness and understanding of some of the core concepts related to CRSE and equitable instruction across content areas and throughout educational systems. They can be taken up by curriculum developers, state or local education agencies, instructional leaders, and teachers. They may be utilized alongside the mathematics resources in the previous table or alone.

Table 2. Additional Resources

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
<i>Culturally Responsive Teaching: A Reflection Guide</i> New America 2020	Curriculum and Pedagogy	All	Reflection Guide	Teachers	✓	✓	✓	✓	✓
<i>Culturally and Linguistically Responsive Guidance Handbook</i> New Mexico Public Education Department 2022	Curriculum and Pedagogy	All	Handbook	District/School Leaders, Teachers	✓	✓	✓	✓	✓
<i>Social Justice Standards: The Learning for Justice Anti-Bias Framework</i> Learning for Justice 2022	Curriculum and Pedagogy	All	Standards/ Outcomes for Curriculum Development	Teachers, District/School Leaders, Coaches	✓	✓	✓	✓	✓

Resource Title Author(s) Publication Year	Focus (Curriculum, Pedagogy, or Both)	Grade Levels	Resource Type	Intended Audience	Essential Characteristics				
					Affirms Racial and Cultural Identities	Cultivates Agency and Belonging	Builds Critical Consciousness	Centers Diverse Perspectives	Centers Student Learning and Academic Success
<u>Assessing Bias in Standards and Curricular Materials</u> Midwest and Plains Equity Assistance Center 2017	Curriculum and Pedagogy	All	Curriculum Analysis Tool/ Rubric	District/School Leaders, Teachers, Coaches	✓		✓	✓	
<u>Culturally Responsive Curriculum Scorecard</u> NYU Metropolitan Center for Research on Equity and the Transformation of Schools 2019	Curriculum	All	Scorecard/ Rubric	Curriculum Writers, Leaders, Teachers, Coaches	✓	✓	✓	✓	
<u>Culturally Responsive Scorecard Toolkit</u> NYU Metropolitan Center for Research on Equity and the Transformation of Schools N.D.	Curriculum and Pedagogy	All	Guide, Resource List	Leaders, Teachers, Coaches	✓	✓	✓	✓	
<u>Culturally Responsive-Sustaining Education Framework</u> New York State Education Department 2018	Curriculum and Pedagogy	All	Culturally Responsive Framework	State/Local Leaders, Higher Education, Teachers, Families	✓	✓	✓	✓	✓

Research and Publications

The references listed below were used to inform the creation of the *Essential Characteristics of Math Curriculum Materials That Advance Culturally Responsive and Sustaining Education* detailed above. These references form the research base upon which the characteristics were created, and they can be used to build deeper knowledge and understanding related to culturally responsive and sustaining education in mathematics.

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