

# Curriculum Council DEI- CRSE Resources: CR-SE and STEM

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# Overarching Themes for DEI/CRSE 22-23 Share

***“CR-SE Framework and Curriculum  
Reviews”***

***“Equity Walks for Classroom  
Environments”***

***“Empowering Student Groups  
using the CR-SE Framework”***



# Next Generation Science Standards and NYS SLS

In the recent 2015 report, Revisiting the STEM Workforce by the National Science Board<sup>3</sup>, it is stated that “the STEM workforce is extensive and critical to innovation and competitiveness” and careers in these fields will only grow in the next decade making it essential for accessibility to equitable learning opportunities for all students to benefit. Over the past several decades as well as recently, streams of research studies, reports, policies, and publications also document the under participation and often limited preparedness of many students across the United States in science, limiting inclusive opportunities to enter the Science, Technology, Engineering, and Mathematics (STEM) workforce and college pathways.

It is in this context that the proposed new state learning standards in science are well positioned to strengthen P-12 science education in our classrooms for all our students. As with any set of instructional standards, they need to be rigorous; they need to demand a balance of conceptual understanding and application and represent a significant level of achievement in science that will enable students to successfully transition to post-secondary education and the workforce.

## HOW WILL THE NGSS SUPPORT COLLEGE AND CAREER READINESS FOR ALL STUDENTS AND PREPARE THEM FOR THE GLOBAL ECONOMY?



Ensuring that all students will develop an in-depth understanding of content and skills in science, engineering, and mathematics, as well as communication, collaboration, inquiry, problem solving, and flexibility—essential for success in the 21st-century global and professional lives.

Students whose schools perform well in science and engineering fields, such as Finland, Korea, Japan, Sweden, Switzerland, Taiwan, and Singapore.

## WHAT DOES THIS LOOK LIKE IN THE CLASSROOM?

Teachers will be required to shift their practice toward how students learn best—in a hands-on, collaborative, and integrated environment rooted in inquiry and discovery. Teaching based on the NGSS calls for more student-centered learning that enables students to think on their own, problem solve, communicate, and collaborate—in addition to learning important scientific concepts.



### Welcoming and Affirming Environment

Collective responsibility to learn about student cultures and communities.

Close relationships with Students & Families.

Social-Emotional Learning Programs.

Materials that represent and affirm student identities.



### High Expectations and Rigorous Instruction

Student-Led Civic Engagement.

Critical Examination of Power Structures.

Project-Based Learning on Social Justice Issues.

Student Leadership Opportunities.



### Inclusive Curriculum and Assessment

Current events incorporated into instruction.

Students as co-designers of curriculum.

Resources written and developed by racially, culturally, and linguistically diverse perspectives.

Instructional strategies that adapt to diverse learning styles.



### Ongoing Professional Learning and Support

Diversity, Equity, and Inclusion Training, examining implicit bias and interrogation of beliefs and assumptions.

Support in aligning curriculum and instruction to the histories, languages, and experiences of traditionally marginalized voices.

STUDENTS

DISTRICT LEADERS  
COMMUNITY MEMBERS

SCHOOL LEADERS

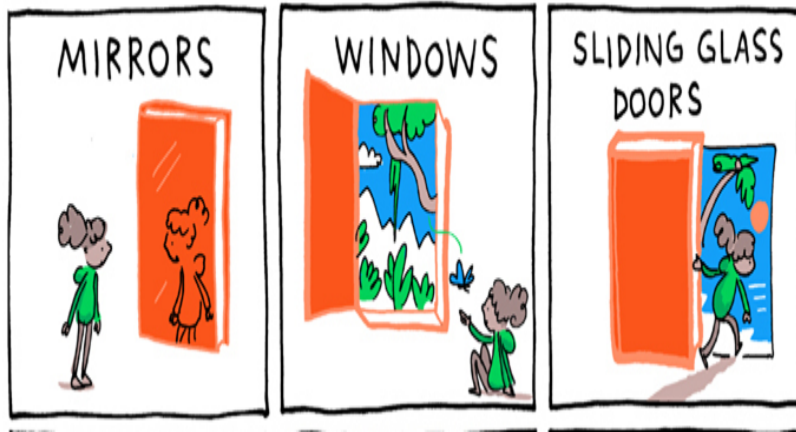
TEACHERS

EDUCATION DEPARTMENT POLICYMAKERS  
HIGHER EDUCATION FACULTY

STUDENTS AND FAMILIES



# Inclusive Curriculum: Windows, Mirrors, and Sliding Doors



..Culturally responsive education is about teaching **the students in front of you**...However, culturally responsive education must also be sustaining, that is it must work to **encourage cultural pluralism\*** and not cultural assimilation....



# STEM: CR-SE Lens



Long Island News

## NAACP Rallies In Brookhaven Over Garbage Disposal Plan

WSHU | By J.D. Allen



BY MELISSA MAUPIN



Workforce Development & Science Education



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### Kindergarten through 12th Grade

Brookhaven Lab is offering in-person and virtual field trip options for the 2022-2023 academic year. All programs continue to advance our mission of developing the next generation STEM workforce. Please review the [Updates to 2022-2023 Field Trips](#) (below) and the individual program and contest pages for detailed information.



#### Updates to 2022-23 Field Trips

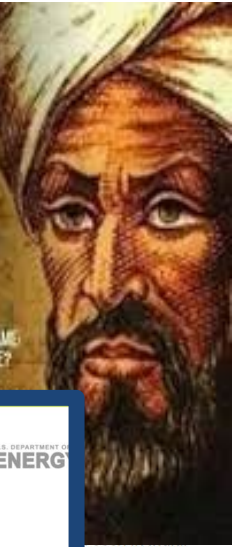
At this time, we are scheduling in-person and virtual field trip options. In the event Suffolk County community COVID-19 levels are HIGH, face coverings are required. Scheduled groups that are unable to follow this requirement will be given the option to

[Brahmi numerals](#). Wikimedia

From the [third century BC](#), we also have written evidence of the [Brahmi numerals](#), the precursors to the modern, Indian or Hindu-Arabic numeral system that most of the world uses today. Once zero was introduced, almost all of the mathematical mechanics would be in place to enable ancient Indians to study higher mathematics.

#### FIVE FACTS ABOUT AL-KHWARIZMI

- 1 HE IS ONE OF THE MOST PROMINENT MATHEMATICIANS IN HISTORY.
- 2 HE WAS A MUSLIM. BUT I ASSUME YOU ALREADY KNEW THAT.
- 3 HE WROTE THE FIRST BOOK ON ALGEBRA. YOU CAN THANK HIM FOR ALL THOSE GREAT ALGEBRA LESSONS YOU'VE HAD IN CLASS.
- 4 THE TERM ALGORITHM WAS DERIVED FROM HIS NAME: AL-KHWARIZMI - ALGORITMI - ALGORITHM. YOU SEE?



In these texts,  $(0^2)$ , six tens [do believe](#) that this

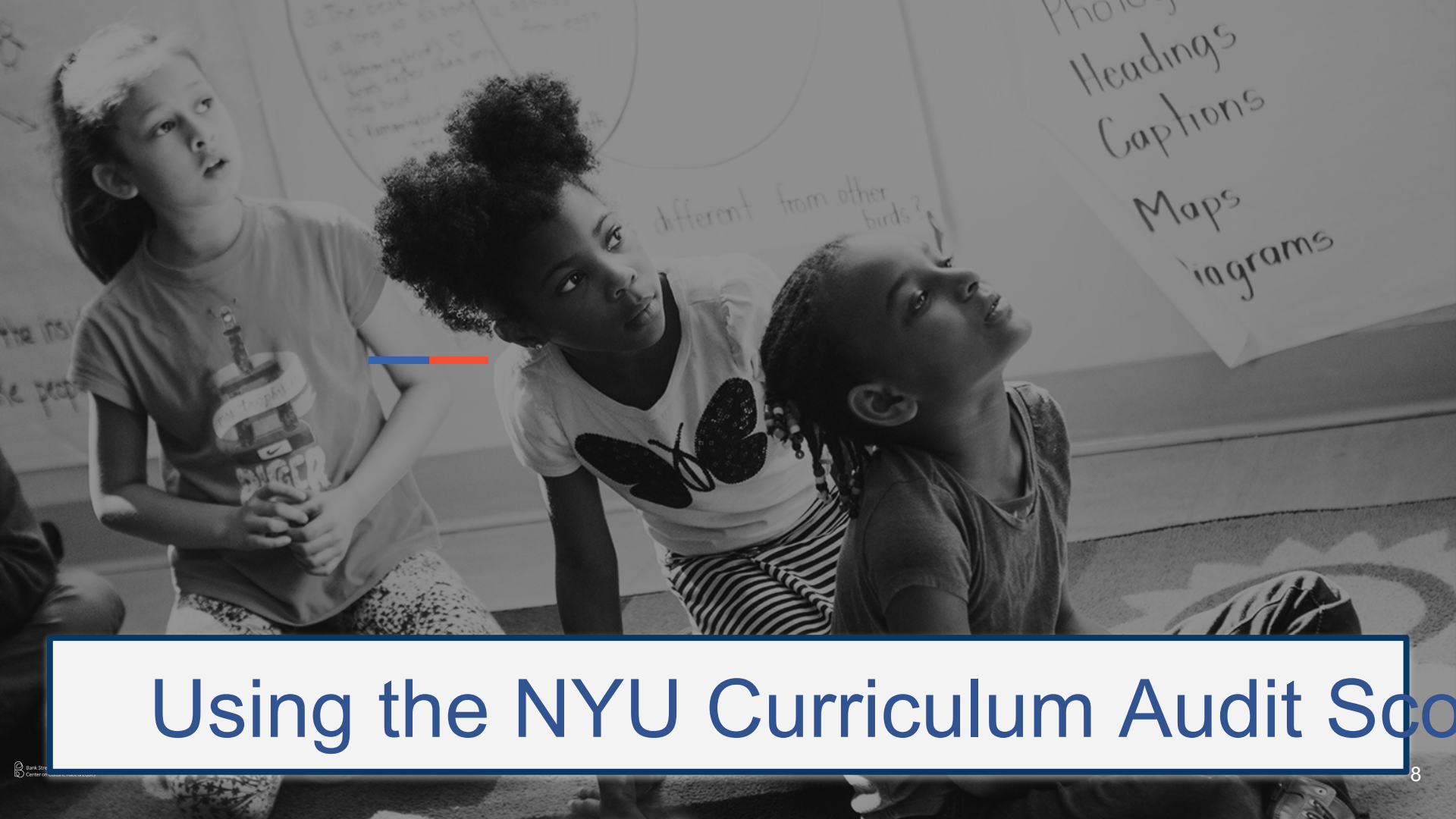
# Types of Curriculum Audits

What is our focus?

Which backgrounds, identities, perspectives, and experiences are represented?

FIGURE 1. Four Types of Curriculum Audits

TYPE OF AUDIT	ESSENTIAL QUESTIONS	SUBJECTS OF INQUIRY
<b>Diversity</b> <i>The presence in the curriculum of individuals representing multiple backgrounds, identities, perspectives, or experiences within a group.</i>	Which backgrounds, identities, perspectives, and experiences are represented in our curriculum? Which aren't?  How diverse should the curriculum be?	<ul style="list-style-type: none"> <li>• Unit topics</li> <li>• Curriculum materials, including assigned readings</li> </ul>
<b>Inclusion</b> <i>Integration of individuals—especially members of groups that have been historically marginalized—into a system.</i>	Do learners see their own experiences reflected and see experiences that are different from their own?  Are historically marginalized groups represented in ways that are rich, affirming, and accurate?	All of the above AND: <ul style="list-style-type: none"> <li>• Student experiences</li> <li>• Family experiences</li> <li>• Alumni experiences</li> <li>• Local communities</li> <li>• Current events</li> </ul>
<b>Equity</b> <i>Building systems to ensure that members of a community can meaningfully participate and fully access benefits without undue burdens.</i>	What does it mean to engage with this curriculum? Who can engage fully? Partially? Not at all?  What are the benefits of this curriculum? Who can access those benefits? Who must take on additional burdens to gain access? Who can't access them at all?	All of the above AND: <ul style="list-style-type: none"> <li>• Lessons</li> <li>• Assignments</li> <li>• Projects</li> <li>• Assessment systems</li> <li>• Length of units</li> <li>• Course sequences</li> </ul>
<b>Justice</b> <i>Righting wrongs, healing and preventing harm, and creating new systems that promote joy, thriving, belonging, and liberation.</i>	What harms has this curriculum caused? What can we do to hold ourselves accountable, heal the harm, and prevent further harm?  What new curriculum can we build to foster joy, thriving, belonging, and liberation?	All of the above AND: <ul style="list-style-type: none"> <li>• School mission and values</li> <li>• Unstated assumptions about what's good/bad, right/wrong, and normal/other</li> <li>• Plans of care for those who experienced harm</li> <li>• Plans of accountability for those who perpetrated harm</li> </ul>



# Using the NYU Curriculum Audit Score



## Culturally Responsive Curriculum Scorecard

**Social Justice Orientation**

Statements	Very Satisfied (5)	Satisfied (4)	Neutral (3)	Not Satisfied (2)	Average Score of scores with weight
14. Curriculum highlights non-dominant perspectives and their strengths and assets, as well as students of diverse race, class, gender, ability, and sexual orientation can relate and participate fully.					
15. The curriculum communicates an asset-based perspective for representing people of diverse race, class, gender, ability, and sexual orientation through that strengths, rather than a deficit-based perspective.					
16. The curriculum does not communicate negatively or hostile stereotypes of marginalized groups through words or images, symbols, or icons.					
17. The curriculum communicates a positive, affirming perspective of marginalized groups through words or images, symbols, or icons.					
18. The curriculum presents different points of view on the representation of people, especially points of view from marginalized communities.					
19. The curriculum provides evidence for students to compare learning to social, political, or environmental issues that affect them and their lives and contribute to change.					
20. The curriculum encourages students to take action that combat inequality or promote equity within the school or local community.					
<b>Total</b>					
<b>Total Social Justice Score</b>					

Comments: Please write any other notes about social justice that are not captured by the questions.

**NYU STEINHARDT** Steinhardt Center for Research on Learning and Transformation of Schools

- A tool created for parents, community members, and teachers to evaluate opportunities for cultural responsiveness in **curriculum** (not what teachers actually do in the classroom).
- Uses a sample of curriculum
- Ask for scorer's judgment; no "right" answer
- Facilitates a deep conversation about how we score as individuals and as a group

What?

# Audit tool: Curriculum Audit/Inventory Review w



**STEAM Curriculum self-audit**  
**Developed by the NYU Metro**  
**Center**

## HOW TO USE THIS SCORECARD

We have designed this scorecard so that it can be customized to the context and conditions of your school district and campaign. Completing the entire document will give you the most comprehensive analysis of how culturally responsive your curriculum is. If you don't have the time or capacity to do that, you can complete an individual section and get a more limited evaluation. We designed this tool with kindergarten through eighth grade STEAM curricula in mind, you can use it with one aspect of STEAM (such as a math curriculum or science curriculum) or with an interdisciplinary STEAM curriculum. If your school doesn't have a set curriculum, you can also use this tool to evaluate the diversity of the school or classroom library.

# NYU Scorecard

TYPE OF AUDIT	ESSENTIAL QUESTIONS	SUBJECTS OF INQUIRY
<b>Diversity</b> <i>The presence in the curriculum of individuals representing multiple backgrounds, identities, perspectives, or experiences within a group.</i>	Which backgrounds, identities, perspectives, and experiences are represented in our curriculum? Which aren't? How diverse should the curriculum be?	<ul style="list-style-type: none"> <li>• Unit topics</li> <li>• Curriculum materials, including assigned readings</li> </ul>
<b>Inclusion</b> <i>Integration of individuals—especially members of groups that have been historically marginalized—into a system.</i>	Do learners see their own experiences reflected and see experiences that are different from their own? Are historically marginalized groups represented in ways that are rich, affirming, and accurate?	All of the above AND: <ul style="list-style-type: none"> <li>• Student experiences</li> <li>• Family experiences</li> <li>• Alumni experiences</li> <li>• Local communities</li> <li>• Current events</li> </ul>

## REPRESENTATION

### STATEMENTS

		Very Satisfi (2)
1	The curriculum centers the origins of science, technology, engineering, arts and/or math within BIPOC communities (Black, Indigenous, people of color).	
2	The curriculum elevates mathematicians, artists, and/or scientists with historically marginalized identities (i.e. non-binary or trans people, women, people of color, people with disabilities, working class people, multilingual people) and their discoveries.	
3	The curriculum acknowledges and/or incorporates the expertise of diverse communities, their cultures, and their historical and/or contemporary experiences.	
4	The curriculum has photos/pictures, names, scenarios, and text that reflect the experiences and interests of students of color in your community.	
5	The curriculum elevates not just “scientists, artists, and mathematicians”, but the everyday users of math, science, arts, technology, and engineering.	
6	The curriculum affirms the multiple forms of communication or language systems during mathematical and scientific argumentation rooted in historically marginalized cultures.	
TOTAL		

# NYU Scorecard

	affirming, and accurate?	
<b>Equity</b> <i>Building systems to ensure that members of a community can meaningfully participate and fully access benefits without undue burdens.</i>	What does it mean to engage with this curriculum? Who can engage fully? Partially? Not at all?  What are the benefits of this curriculum? Who can access those benefits? Who must take on additional burdens to gain access? Who can't access them at all?	All of the above AND: • Lessons • Assignments • Projects • Assessment systems • Length of units • Course sequences
<b>Justice</b> <i>Righting wrongs, healing and preventing harm, and creating new systems that promote joy, thriving, belonging, and liberation.</i>	What harms has this curriculum caused? What can we do to hold ourselves accountable, heal the harm, and prevent further harm?  What new curriculum can we build to foster joy, thriving, belonging, and liberation?	All of the above AND: • School mission and values • Unstated assumptions about what's good/bad, right/wrong, and normal/other • Plans of care for those who experienced harm • Plans of accountability for those who perpetrated harm

## MATERIALS/RESOURCES

### STATEMENTS

		Very Satisfied (2)	Satisfied (1)	Unclear (-1)	Not Satisfied (-2)	GROUP AVERAGE SCORE
27	The curriculum provides opportunities for students to use accessible technology and manipulatives to explore STEAM concepts in ways that reflect a variety of ways of "doing."					
28	Issues of social justice, equity, and Black, Indigenous, and people of color's experiences and contributions are reflected in homework/classroom assignments and assessments.					
29	The curriculum incorporates the arts as a tool to center experiences within STEM and innovation.					
30	Curriculum rigor is not dependent on access to resources, materials and technology that students and schools may not have. In other words, the curriculum materials are fully accessible; all resources, materials and technology options are rigorous and interesting. [Ex. If students can engage curriculum materials with a computer or paper, the paper materials should be just as rigorous, interesting, and engaging as using the computer].					
31	The resources, materials and technology referenced in lessons include resources from BIPOC communities [Black, Indigenous, people of color].					
TOTAL						



# NYU Scorecard-extended

	affirming, and accurate?	Current evidence
<b>Equity</b> <i>Building systems to ensure that members of a community can meaningfully participate and fully access benefits without undue burdens.</i>	<p>What does it mean to engage with this curriculum? Who can engage fully? Partially? Not at all?</p> <p>What are the benefits of this curriculum? Who can access those benefits? Who must take on additional burdens to gain access? Who can't access them at all?</p>	<p>All of the above AND:</p> <ul style="list-style-type: none"> <li>• Lessons</li> <li>• Assignments</li> <li>• Projects</li> <li>• Assessment systems</li> <li>• Length of units</li> <li>• Course sequences</li> </ul>
<b>Justice</b> <i>Righting wrongs, healing and preventing harm, and creating new systems that promote joy, thriving, belonging, and liberation.</i>	<p>What harms has this curriculum caused? What can we do to hold ourselves accountable, heal the harm, and prevent further harm?</p> <p>What new curriculum can we build to foster joy, thriving, belonging, and liberation?</p>	<p>All of the above AND:</p> <ul style="list-style-type: none"> <li>• School mission and values</li> <li>• Unstated assumptions about what's good/bad, right/wrong, and normal/other</li> <li>• Plans of care for those who experienced harm</li> <li>• Plans of accountability for those who perpetrated harm</li> </ul>

## SOCIAL JUSTICE

### STATEMENTS

		Very Satisfied (2)
7	Curriculum highlights and affirms the knowledge systems of Indigenous, Black/ African, Brown, and non-Western conceptions of science, technology, engineering, arts, and math (such as interdependence, sustainability, and continual change).	
8	The curriculum and instructional activities promote or provoke critical questions about science, technology, engineering, arts, and/or math and the societal status quo.	
9	The curriculum and instructional activities present alternatives or allow students to present alternatives about the role science, technology, engineering, arts, and/or math plays in existing social structures.	
10	The curriculum presents multiple understandings of a scientific, mathematical, or artistic concept or theory, especially highlighting points of view from marginalized people/communities.	
11	The curriculum provides avenues for students to see STEAM as a way to understand and improve their world, take actions that combat inequity or promote equity, and connect learning to social, political, and/or environmental concerns.	
12	The curriculum presents social situations and problems not as individual problems but as embedded within a societal and/or systemic context.	
13	The curriculum encourages students to critically examine dominant knowledge systems as scientists, mathematicians, and artists.	



# NYU Scorecard-extended

	affirming, and accurate?	Current evidence
<b>Equity</b> <i>Building systems to ensure that members of a community can meaningfully participate and fully access benefits without undue burdens.</i>	<p>What does it mean to engage with this curriculum? Who can engage fully? Partially? Not at all?</p> <p>What are the benefits of this curriculum? Who can access those benefits? Who must take on additional burdens to gain access? Who can't access them at all?</p>	<p>All of the above AND:</p> <ul style="list-style-type: none"> <li>• Lessons</li> <li>• Assignments</li> <li>• Projects</li> <li>• Assessment systems</li> <li>• Length of units</li> <li>• Course sequences</li> </ul>
<b>Justice</b> <i>Righting wrongs, healing and preventing harm, and creating new systems that promote joy, thriving, belonging, and liberation.</i>	<p>What harms has this curriculum caused? What can we do to hold ourselves accountable, heal the harm, and prevent further harm?</p> <p>What new curriculum can we build to foster joy, thriving, belonging, and liberation?</p>	<p>All of the above AND:</p> <ul style="list-style-type: none"> <li>• School mission and values</li> <li>• Unstated assumptions about what's good/bad, right/wrong, and normal/other</li> <li>• Plans of care for those who experienced harm</li> <li>• Plans of accountability for those who perpetrated harm</li> </ul>

## TEACHER'S MATERIALS

### STATEMENTS

		Very Satisfied (2)
15	The authors of the teachers' materials are people of diverse identities (race/ethnicity, gender, other identities).	
16	Guidance is provided to teachers on being aware of one's biases, assumptions, and the gaps between one's own culture and students' cultures (implicit bias).	
17	The teachers' materials ask teachers to reflect on their own practices and experiences learning STEAM subjects and critique them through the lens of cultural responsiveness.	
18	Guidance is provided on combating the legacy of STEAM education related trauma amongst historically marginalized communities and on designing healing and joyful STEAM experiences.	
19	Guidance is provided on using students' everyday lives as the starting point for learning, and making real-life connections between academic content and the local neighborhoods, culture, environment, community issues, and current events.	
20	Guidance is provided on creating opportunities to meaningfully engage students' families to enhance lessons.	
21	Guidance is provided on appropriately using Indigenous and non-Western resources to understand math and science, including oral histories, legends, and community knowledge.	
22	Guidance is provided on engaging students in culturally responsive experiential learning activities.	
23	Guidance includes, for applicable lessons, <u>a range of possible student responses</u>	

# How do we start using the scorecards?

**Step 1: Select your curriculum audit team members and select a lead scorer. (grade band levels)**

**Step 2: Gather Curriculum maps/textbooks/lab assignments/projects/homework assignments/student work and place the selected material with each audit team according to the grade band/s.**

**Step 3: All members from each team:**

- ☐ Choose curriculum materials to review
- ☐ Review the statements on the Google form
- ☐ Make sure the team understands each statement, and refer to the handouts/slides and answer any question...(You may pull me into your conversation if you have questions)
- ☐ Chart key words, ideas and qualities from the statements that you will be looking for as you read/survey the curriculum.
- ☐ Conduct the evaluation
- ☐ Discuss findings with your team
- ☐ Identify three areas of strength and three areas of growth (Record on chart paper)

# • Digital Curriculum Audit Tool •

## Curriculum Audit Tool Digital CRSE Scorecard

### Instructions:

We designed this tool with K through 8 grade English Language Arts curricula in mind, but feel free to try it with other grades and subjects as well. If your school doesn't have a set curriculum, you can also use this tool to evaluate the diversity of the school or classroom library.

### Scoring Guidelines

If the statements on the scorecard are not clear to you, look in the Appendix for additional explanations.

**Very Satisfied (+2)** If you are very satisfied, you should be able to provide an abundance of specific examples (stories, passages, illustrations, quotes, assignments, etc.) from the curriculum to show how and why the statement is accurate. It is clear that the text was designed to be culturally responsive. Score this with two points.

**Satisfied (+1)** If you are satisfied, you should be able to provide some evidence from the curriculum that the statement is accurate. The text may not have been designed to be culturally responsive, but elements of CRE are apparent in most of the text. Score this with one point.

**Unclear (-1)** If you are unclear, it is not evident to you whether there is evidence from the curriculum that the statement is accurate. Score this with -1 points.

**Not Satisfied (-2)** If you are not satisfied, you feel that there is little or no evidence in the curriculum that the statement is accurate. There is little or no evidence of cultural responsiveness. Score this with negative 2 points.

Please write any observations about representation that are not captured by the questions.

# • Sample Questions •

The curriculum features visually diverse <sup>\*</sup>  
characters, and the characters of color do  
not all look alike

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Unclear
- ☐ Not Satisfied

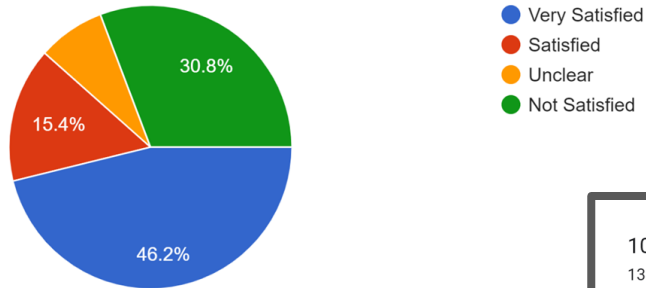
There are references to different ethnic and <sup>\*</sup>  
cultural traditions, languages, religions, names  
and clothing.

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Unclear

# Sample Curriculum Audit with an Equity Lens Responses

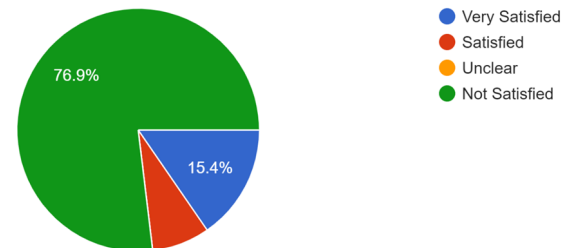
7. There are references to different ethnic and cultural traditions, languages, religions, names and clothing.

13 responses



10. Characters with disabilities are represented

13 responses





# Follow-up

## Debrief

- Where are the strengths?
- Where are the opportunities for growth?
- Who is impacted by this new information?
- What voices are missing from this conversation?

## Plan

- What are 2-3 critical areas we need to address based on this audit?
- Who is needed to help plan for the improvements?
- What is an ideal and practical time frame (inclusive of professional development)

