THE CULTURALLY RESPONSIVE-SUSTAINING STEAM CURRICULUM SCORECARD

Created by Leah Q. Peoples, Tahia Islam and Timothy Davis

ABOUT NYU METRO CENTER

The Metropolitan Center for Research on Equity and the Transformation of Schools (NYU Metro Center) promotes equity and opportunity in education through engaged sciences–research, program evaluation, policy analysis, and professional assistance to educational, governmental, and community agencies serving vulnerable communities and populations. NYU Metro Center is nationally and internationally renowned for its work on educational equity and school improvement, bringing together scholars, educators, and innovators from diverse backgrounds to collaborate on a range of projects to strengthen and improve access, opportunity, and educational quality across varied settings, but particularly in striving communities.

For four decades, NYU Metro Center has been a partner and resource for schools and school districts throughout the U.S. and beyond, including Detroit, Denver, Houston, New York City, Pittsburgh, San Juan, Washington, D.C., and Wilmington. Its research and community engagement programs help prepare teachers, school leaders and staff, and parents to improve school culture and climate, reduce referrals to special education, and better support the unique needs of youth across a range of abilities and backgrounds. Its research initiatives inform the policy and intervention communities on how best to serve vulnerable populations in and beyond our school systems.

ABOUT EJ-ROC

The Education Justice Research and Organizing Collaborative (EJ-ROC) brings together researchers and community organizers to provide critical research, data, policy and strategic support for the education justice movement. EJ-ROC aims to democratize education data, research and policy; maximize the synergy between research and community organizing; magnify the voices of grassroots communities of color; and advance the capacity of organizing efforts to design solutions, make demands, and sustain policy wins.

For more information, please contact: **nyu-ejroc@nyu.edu**

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PURPOSE OF THE SCORECARD

NYU Metro Center designed this tool to help parents, teachers, administrators, students, and community members determine the extent to which their schools' Science, Technology, Engineering, Arts, and Mathematics (STEAM) curricula are (or are not) culturally responsive. This scorecard can be used to evaluate just one discipline of STEAM, like a math curriculum or a science curriculum, or an interdisciplinary curriculum that includes all aspects of STEAM. We hope that this collaborative evaluation process will provoke thinking about what students should learn, how they should learn it, why they should learn it, and how curriculum can be transformed to engage students effectively. This tool is a continuation of our first scorecard, the Culturally Responsive Curriculum Scorecard for K-8 ELA Curriculum. The CRSE STEAM Scorecard is informed by scholarship on culturally responsive and sustaining education and is intended to be used for K-12 STEAM curricula. See the resource list and reference list for additional information.

ESSENTIAL GROUNDING BEFORE USING THE CRSE STEAM CURRICULA SCORECARD

Welcome to the Culturally Responsive and Sustaining STEAM Curricula Scorecard!

This scorecard is for you, youth, parents, educators, administrators, and advocates to collaboratively evaluate STEAM curricula. Far too often, curricula evaluations are delegated to those who are "officially" credentialed in STEAM subjects. Those credentials, however, may not have required experts to have meaningful and critical understandings of culturally responsive and sustaining education. Furthermore, previous evaluations of curricula may not have considered culturally responsive or sustaining education as foundational to high quality curricula.

High quality STEAM curricula is culturally responsive and sustaining, in other words, **if STEAM curricula does not provide opportunities for culturally responsive and sustaining education, it cannot be high quality.** Students deserve to learn about STEAM subjects in ways that reflect themselves and their communities, are critical of power, identity, problems and solutions, and foster imagination about STEAM possibilities that meaningfully include people of color, women, LGTBTQ people, people who speak multiple languages and more. These communities are experts in their own cultural experiences regardless of credentials.

It's important to make this note, because STEM fields have a history of excluding groups of people and using credentials to gatekeep STEAM spaces. Marginalized community members (students, families, community members at large) are experts in their own cultural experiences. Their voices are essential to evaluate the extent to which STEAM curricula are culturally responsive and sustaining. In recognition of the possible negative, stressful, or traumatic experiences or memories that could be surfaced when thinking about STEM experiences in school and with curricula, historically marginalized folks are invited to (re)claim STE(A)M and your right to it. It is imperative that this evaluation take place within conditions that center those marginalized communities in the decision-making process during this evaluation. That means community members leading or co-leading the evaluation process. It also means that STEAM "experts" affirm community members' knowledge, respect their voices, decenter yourselves, exercise humility, and work in collaboration with community members. Expert knowledge is critical to a STEAM curriculum

> "Historically marginalized folks are invited to (re)claim STE(A)M and their right to it."

evaluation, but there must be care to not make the STEAM curriculum evaluation space inaccessible.

Some people might be thinking, "surely math is neutral, apolitical, objective and factual, so how culturally responsive and sustaining can any textbook or curricula actually be?" Part of the work required to use this scorecard will be accepting various explorations of who are mathematicians or scientists, and what "counts" as science, technology, engineering, arts, and math, and why? This guide provides definitions, written explanations, visual explanations, and video explanations of culturally responsiveness within the STEAM context, the CRSE STEAM Scorecard, and guidelines for evaluating curriculum. As you prepare to evaluate STEAM curriculum, understand that STEM disciplines are not "objective" and can be subject to the same inequities observed in English Language Arts and History curricula (such as excluding marginalized communities, excluding non-White knowledge systems, or symbolic and ineffective inclusion).

CRSE STEAM EVALUATION RESOURCES

The Racial Politics of STEM Education in the USA: Interrogations and Explorations
by Sepehr Vakil and Rick Ayers

This publicly accessible article provides an overview of how STEM education is racialized.

www.tandfonline.com/doi/full/10.1080/136133 24.2019.1592831

CRSE STEAM Curriculum Evaluation Grounding Guide

This guide provides seven questions individuals can use to prepare themselves for the evaluation by reflecting on their identity, privilege, perspectives, and self care.

WHAT IS CULTURALLY RESPONSIVE AND SUSTAINING EDUCATION?

Culturally responsive and sustaining education (closely related to the terms "culturally relevant" teaching and pedagogy) refers to the combination of teaching, pedagogy, curriculum, theories, attitudes, practices, and instructional materials that center students' culture, identities, and contexts throughout educational systems.

Gloria Ladson-Billings and Geneva Gay's scholarship is foundational to culturally responsive education, while Django Paris and Samy H. Alim's scholarship are foundational for culturally sustaining education. Some key principles of culturally responsive and sustaining education (CRE) include (1) validating students' experiences and values, (2) disrupting power dynamics that privilege dominant groups, and (3) empowering students. NYU Metro Center's report "Culturally Responsive Education: A Primer for Policy and Practice" more fully details the origins, significance, and impact of CRE in schools. New York State's Board of Education also provides a framework for culturally responsive-sustaining education that includes guidance for students, teachers, school leaders, district leaders, families and community members, higher education faculty and administrators, and education department policymakers. The Education Justice Research and Organizing Collaborative (EJ-ROC) also published a CRSE Overview infographic that provides an overview of CRSE and an illustrated guide to CRSE.

CRSE & STEAM

The CRSE STEAM Curriculum scorecard is informed by science, technology, engineering, arts, and math education articles that have an explicit focus on equity and adhere to the core tenets of culturally responsive and sustaining education. While most of this literature focuses on teaching practices and educators' cultural competency, knowledge of students, knowledge of content, and standards alignment (Grimes, 2012; Brown, 2017; Aguirre & Zavala, 2013, Jordan et al 2019), we've translated this research to be applicable to curriculum used in classrooms. Three commonly discussed CRSE STEAM concepts include identity and representation, addressing issues of social justice, and expanding worldviews and conceptions of what counts as STEAM.

IDENTITY

One of the most frequently cited challenges that contribute to inequities across science, technology, engineering, and math, is that schools do not create conditions that affirm or support students' STEM identity. In other words, many marginalized students do not see themselves as scientists or mathematicians. Furthermore, research suggests that some students of color believe that in order to become scientists and mathematicians that they must reject their cultural identities in order to be successful. Researchers Walls, Buck and Akerson (2013) use Gloria Anzaldua's term "Nepantla" or the in-between state to frame these challenges that students experience. The scorecard includes several statements that interrogate the opportunities that curriculum provides for students to see people like themselves and their actual selves in STEAM disciplines.
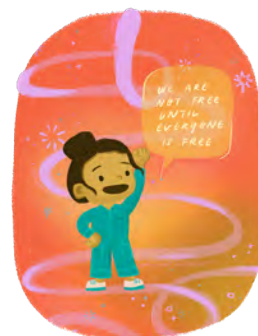
ISSUES OF SOCIAL JUSTICE

Science, technology, engineering, the arts, and mathematics are not objective explorations of the mysteries of the universe, but rooted in historical discoveries tied to societies of people. They are studied to solve challenges affecting human society or alternatively, to advance certain groups of people for profit and power. Furthermore, with statewide pushes for comprehensive STEAM education and "Computer Science for All" across schools, particularly for Black and Latinx students, it's clear that these are subjects that can promote socioeconomic mobility, or without access, further stratify groups by class. The issue of equitable STEAM access is a social justice issue, and STEAM itself should be taught to solve social justice issues. They are intertwined.

CURRICULUM

Curriculum can be a powerful tool to inspire activists, but even STEAM curriculum has an agenda that can promote a certain way of thinking. In Abdulrahim and Orosco's (2020) article on Culturally Responsive Mathematics, they unpack that students may receive mathematics instruction that prioritizes individualism and competition versus cooperation and collectivism, which can promote a dominant society's learning patterns. The scorecard includes several statements that interrogate whether students have a curriculum that provides the opportunity to question the status quo or work to solve a societal issue in their community.

EXPANDING STEAM WORLDVIEWS

There is a common misconception that implementing CRSE in STEAM is difficult or more challenging than it is in humanities-based classes like English or History. This perspective is rooted in the false notion that the sciences and math are objective, apolitical, not rooted in culture and not racialized. In Sepehr Vakil and Rick Ayers' (2019) article, The Racial Politics of STEM Education in the USA: Interrogations and Explorations, researchers unpack dominant STEM narratives and begin to reimagine STEM education. Much of the sociopolitical context highlighted in their article also undergirds a larger conversation about western and White worldviews of STEAM and Indigenous, Black, and other communities of color worldviews of STEAM. These worldviews can fundamentally reframe curriculum, the questions that are asked and answers, and the ways the students explore STEAM phenomenon.

See our CRSE STEAM Resource List to access articles, blogs, and tools related to CRSE and STEAM.

> **"**
>
> *STEM is a natural extension of the work we do as human beings already. We must elevate students and communities, especially those who've been marginalized in these paradigms.*
>
> **"**
>
> JOSÉ LUIS VILSON

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.

STEP 1 · GET YOUR CHILD'S/SCHOOL'S CURRICULUM

Go to your teacher, principal, or district office, and ask to see your child's or school's science, technology, engineering, arts, or math curriculum. In many districts, there is a Parent Bill of Rights that gives parents the right to access their child's curriculum. If the school is using a commercial curriculum, ask for a copy or the name and publisher so you can look it up online. (If you need to purchase it, NYU Metro Center can help). If the school is using a home-made curriculum, ask for a copy, or at least a sample of a few months of lesson materials. If they refuse to give you the curriculum, take your request to a higher level in the district, or discuss with your team to decide next steps.

STEP 2 · SELECT YOUR CURRICULUM EVALUATION TEAM

The curriculum scorecard will work best if you have a team of at least 3 people with diverse identities (race, gender, age, sexuality, class, national origin) and roles (parent, student, teacher, administrator, community member) who work together to evaluate the curriculum. These people do not have to be education professionals nor have prior experience with evaluation. The more people, the better!

STEP 3 · CHOOSE THE GRADES, UNITS, AND LESSONS TO ANALYZE

Curricula can be thousands of pages, so you will need to select one or a few grades, units, and lessons to focus on (a sample of the larger curricula). The units you choose should not focus specifically on diversity and multiculturalism; they should be typical units. If you are able to cover more than one grade, select at least one lower and one upper grade.

> "
> *I think that the thing I most want you to remember is that research is a ceremony. And so is life. Everything that we do shares in the ongoing creation of our universe.*
> "
>
> SHAWN WILSON

STEP 4 · DETERMINE WHICH VERSION OF THE SCORECARD YOUR TEAM NEEDS

For Physical Textbooks or Printed Samples: Use the paper or pdf version of this scorecard. If your evaluation team is evaluating digital curriculum materials or conducting evaluations virtually, please use the digital scorecard sheet.

STEP 5 · REVIEW THE SCORECARD AND PULL OUT KEYWORDS

Once you have your curriculum and the scorecard in hand, review the statements for the scorecard you will begin with (Representation, Social Justice, Teachers Materials, or Resources/Materials). Make sure the team understands each statement, and refer to the Glossary or Reading List for additional information. Chart key words, ideas and qualities from the statements that you will be looking for as you read the curriculum. This will help ensure that as you read, you are focused on the information you'll need in order to effectively score.

STEP 6 · CONDUCT THE EVALUATION

The scorecard asks for your level of satisfaction with the curriculum on various measures. There is no right answer; this is just your opinion as someone who cares about culturally responsive education. As you answer each statement, use the Scoring Guidelines to help you decide your ratings.

Note that each section has a "Documenting CRSE Attempts/ Inclinations to Give Credit" at the end of each scorecard. This section is a direct result of piloting the CRSE STEAM Scorecard. In multiple instances, evaluators felt inclined to acknowledge effort or perceived intention of the curriculum. If it is useful, track these moments and answer the following key questions: Is the attempt problematic? Has the attempt earned a

satisfactory rating? (Or in other words, does this attempt represent culturally responsive and sustaining STEAM?). If individuals on your evaluation team use this section, be sure to collectively interrogate your team's expectations of curriculum and what students' deserve. Does your team have low expectations for CRSE STEAM? Does your team struggle to see how content could be culturally responsive and sustaining? Consider the accompanying CRSE STEAM Resource list to understand the possibilities for STEAM to be CRSE.

STEP 7 ## SCORE THE EVALUATION

Tally your score for each section of the scorecard. A curriculum may excel in one area and fall short in another, and it is important to record those differences. You should come out with one score for each of the following sections:

+ Representation
+ Social Justice
+ Teachers Materials
+ Materials/Resources

STEP 8 ## DISCUSS WITH YOUR TEAM

Discuss the process with your team: Did anything new come up? What was easy and what was hard? Did some items seem more important than others? This is also an opportunity to strategize about next steps: Do you think this evaluation provides an accurate picture of the curriculum? Does additional information need to be collected? Is there anyone you want to meet with to discuss the results?

STEP 9 ## SHARE THE RESULTS

Let other people know how culturally responsive your curriculum is! Please share the results of your scorecard through this link: bit.ly/scorecardresults. You can share results anonymously and by doing so you help to create a community-driven data set that can be used to improve STEAM curricula.

Please share the results of your scorecard at

bit.ly/STEAMscorecardresults.

Results can be anonymous and you will help to create a community-driven data set that can be used to improve STEAM curricula.

DIVERSITY OF AUTHORS

	Girl/Woman	Boy/Man	Non-Binary	TOTAL
Middle Eastern				
Asian/Pacific Islander				
Black/African				
Latinx				
Native American				
White				
Racially Ambiguous				
Multiracial				
People with Disabilities				

The classroom remains the most radical space of possibility in the academy.

BELL HOOKS

REPRESENTATION

STATEMENTS

		Very Satisfied (2)	Satisfied (1)	Unclear (-1)	Not Satisfied (-2)	GROUP AVERAGE SCORE
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						
TOTAL REPRESENTATION SCORE						

REPRESENTATION:

DOCUMENTING CRSE ATTEMPTS/INCLINATIONS TO GIVE CREDIT

Use this space to document what you perceive as attempts of culturally responsiveness.
Then complete the following columns starting at the left column and ending on the right.

Statement Number/s	Attempt(s)	Is the attempt problematic? Why?	Has this attempt earned a satisfactory rating?

SOCIAL JUSTICE

	STATEMENTS	Very Satisfied (2)	Satisfied (1)	Unclear (-1)	Not Satisfied (-2)	GROUP AVERAGE SCORE
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.					
14	The curriculum affirms the multiple forms of communication or language systems during mathematical and scientific argumentation rooted in historically marginalized cultures.					
	TOTAL					
	TOTAL SOCIAL JUSTICE SCORE					

SOCIAL JUSTICE:

DOCUMENTING CRSE ATTEMPTS/INCLINATIONS TO GIVE CREDIT

Use this space to document what you perceive as attempts of culturally responsiveness.
Then complete the following columns starting at the left column and ending on the right.

Statement Number/s	Attempt(s)	Is the attempt problematic? Why?	Has this attempt earned a satisfactory rating?

TEACHER'S MATERIALS

STATEMENTS		Very Satisfied (2)	Satisfied (1)	Unclear (-1)	Not Satisfied (-2)	GROUP AVERAGE SCORE
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, a range of possible student responses that could all be valid, given the range of student experiences and perspectives.					

STATEMENTS		Very Satisfied (2)	Satisfied (1)	Unclear (-1)	Not Satisfied (-2)	GROUP AVERAGE SCORE
24	Guidance is provided on how to design lessons or engage in conversations that use STEAM to disrupt power inequities or create opportunities for students to practice disruption.					
25	Guidance is provided on planning opportunities for students to create and teach lessons to their peers.					
26	Guidance is provided to help teachers foster environments of collaboration that go beyond group work by meshing individual's assets, resources, and strengths (such as various ways of knowing, doing and being) to advance group and individual learning.					
TOTAL						
TOTAL TEACHER'S MATERIALS SCORE						

TEACHER'S MATERIALS:

DOCUMENTING CRSE ATTEMPTS/INCLINATIONS TO GIVE CREDIT

Use this space to document what you perceive as attempts of culturally responsiveness.
Then complete the following columns starting at the left column and ending on the right.

Statement Number/s	Attempt(s)	Is the attempt problematic? Why?	Has this attempt earned a satisfactory rating?

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					
	TOTAL MATERIALS/RESOURCES SCORE					

MATERIALS/RESOURCES:

DOCUMENTING CRSE ATTEMPTS/INCLINATIONS TO GIVE CREDIT

Use this space to document what you perceive as attempts of culturally responsiveness.
Then complete the following columns starting at the left column and ending on the right.

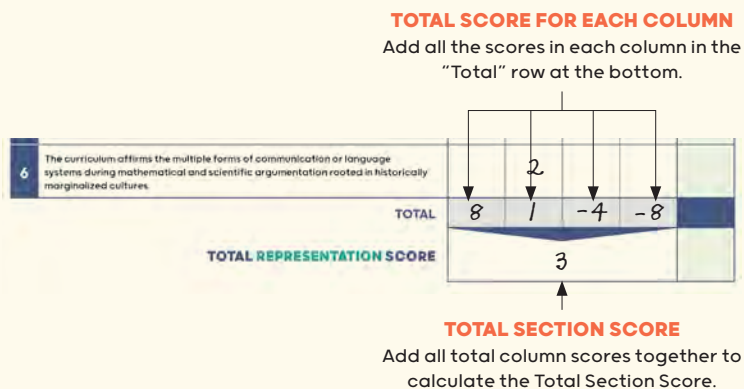| Statement Number/s	Attempt(s)	Is the attempt problematic? Why?	Has this attempt earned a satisfactory rating?

SCORECARD CALCULATIONS

There are two ways to understand the results of your team's scorecard calculations:

1. Interpret the total score for each section of the scorecard, and
2. Interpret the distribution of scores within each section.

These two approaches in combination will help you understand the extent to which your school's curriculum is culturally responsive.

If you are working with a team and **used average scores** for each statement, round each average score up or down to the nearest whole number.

The **following example** shows calculations for the Representation section of the Scorecard:

TOTAL SCORE FOR EACH COLUMN
Add all the scores in each column in the "Total" row at the bottom.

6	The curriculum affirms the multiple forms of communication or language systems during mathematical and scientific argumentation rooted in historically marginalized cultures.		2	
	TOTAL	8	1	-4	-8
	TOTAL REPRESENTATION SCORE		3	

TOTAL SECTION SCORE
Add all total column scores together to calculate the Total Section Score.

The total for the Very Satisfied column is 8, the total for the Satisfied column is 1, the total for the Unclear column is -4, and the total for the Not Satisfied column is -8. The total section score for Representation is -3 because 8 + 1 + -4 + -8 = -3.

INTERPRETING TOTAL SCORES FOR EACH SECTION

Use the Total Section Score and the corresponding interpretation guide to determine how your curriculum measures up on a spectrum from Culturally Destructive to Culturally Responsive. In the example above, the Total Section Score for Representation is -3, which categorizes the curriculum's Representation as Culturally Insufficient.

INTERPRETING THE DISTRIBUTION OF SCORES FOR EACH SECTION

The distribution of scores refers to your pattern of satisfaction with each statement. The distribution of scores will help you evaluate the strengths and weaknesses of a curriculum within particular areas. For example, it is possible that you are Very Satisfied with Diversity of Characters (statements 1-7) in the Representation section, but Not Satisfied with character's Accurate Portrayals (statements 8-13).

To interpret the distribution of your scores, first determine how consistent your level of satisfaction is for each section of the scorecard. Generally speaking, do you rank most of the statements as Very Satisfied or Satisfied? Do you rank most statements as Unclear? Do you rank most statements as Not Satisfied? Are there any statements that depart from the trend of how you rank most statements? If your level of satisfaction is not consistent, determine whether or not there is a pattern and note these differences by writing out the strengths of the curriculum (where you were satisfied) or the weaknesses of the curriculum (where the curriculum was unclear or where you were not satisfied). Interpreting the distribution of scores can help you develop targeted next steps for creating or purchasing more culturally responsive curriculum or supplementing existing curriculum in the short term.

WHAT ABOUT DOCUMENTED ATTEMPTS AT CRSE?

After several rounds of piloting the CRE STEAM Scorecard, the Documented Attempts at CRSE section of the scorecard was included to provide a productive outlet for acknowledging that an attempt was made. It has no impact on total scores for each section, and thus does not impact your interpretation of scores. However, these documented attempts may be used to understand what CRSE isn't and to articulate critiques with various stakeholders. These critiques may be useful in determining next steps.

INTERPRETING YOUR SCORES

REPRESENTATION

CULTURALLY DESTRUCTIVE	CULTURALLY INSUFFICIENT	EMERGING AWARENESS	CULTURALLY AWARE	CULTURALLY RESPONSIVE
-12 to -6	**-5 to -1**	**0 to 4**	**5 to 8**	**9 to 12**
The curriculum likely has little to no representation beyond White male scientists, mathematicians, and artists. The curriculum likely fails to acknowledge the expertise of diverse communities or the everyday users of STEAM.	The curriculum likely minimally acknowledges the expertise and contribution of diverse communities or the everyday users of STEAM. The curriculum likely includes almost no texts, images, and assignments that allow students to learn by connecting their everyday experiences to STEAM lessons	The curriculum occasionally and inconsistently centers and elevates BIPOC individuals and community contributions, expertise, and worldviews in the curriculum. The curriculum likely includes a few texts, images, and assignments that allow students to learn by connecting their everyday experiences to STEAM lessons.	The curriculum somewhat consistently centers and elevates BIPOC individuals and community contributions, expertise, and worldviews in the curriculum. The curriculum likely includes some texts, images, and assignments that allow students to learn by connecting their everyday experiences to STEAM lessons.	The curriculum likely centers and elevates BIPOC individuals and community contributions, expertise, and worldviews in the curriculum. The curriculum likely includes sufficient texts, images, and assignments that allow students to learn by connecting their everyday experiences to STEAM lessons.

SOCIAL JUSTICE

CULTURALLY DESTRUCTIVE	CULTURALLY INSUFFICIENT	EMERGING AWARENESS	CULTURALLY AWARE	CULTURALLY RESPONSIVE
-16 to -8	**-7 to -1**	**0 to 6**	**7 to 11**	**12 to 16**
The curriculum likely centers White, Eurocentric, or Western ideas and culture throughout the majority of the text.	The curriculum likely centers White, Eurocentric, or Western ideas and culture, while sprinkling in non-Western ideas throughout the majority of the text.	The curriculum likely centers White, Eurocentric, or Western ideas and culture, and includes some non-Western ideas throughout the majority of the text.	The curriculum likely includes both Western and non-Western ideas and culture.	The curriculum likely meaningfully includes both Western and non-Western ideas and culture.
The curriculum likely includes prominent harmful biases, stereotypes, or positioning of marginalized communities (BIPOC, women, LGBTQ+, etc).	The curriculum likely includes some harmful biases, stereotypes, or positioning of marginalized communities (BIPOC, women, LGBTQ+, etc).	The curriculum likely includes a few harmful biases, stereotypes, or positioning of marginalized communities (BIPOC, women, LGBTQ+, etc).	The curriculum likely does not include harmful biases, stereotypes, or positioning of marginalized communities (BIPOC, women, LGBTQ+, etc).	The curriculum likely does not include harmful biases, stereotypes, or positioning of marginalized communities (BIPOC, women, LGBTQ+, etc) and uses critical perspectives in STEAM to combat them.
The curriculum likely provides zero to very few opportunities to challenge dominant knowledge systems, understand STEAM within a societal context, or provoke critical questions about the status quo.	The curriculum likely provides very few opportunities to challenge dominant knowledge systems, understand STEAM within a societal context, or provoke critical questions about the status quo.	The curriculum likely provides a few opportunities to challenge dominant knowledge systems, understand STEAM within a societal context, or provoke critical questions about the status quo.	The curriculum likely provides some opportunities to challenge dominant knowledge systems, understand STEAM within a societal context, or provoke critical questions about the status quo.	The curriculum likely provides sufficient opportunities to challenge dominant knowledge systems, understand STEAM within a societal context, or provoke critical questions about the status quo.

TEACHER'S MATERIALS

CULTURALLY DESTRUCTIVE	CULTURALLY INSUFFICIENT	EMERGING AWARENESS	CULTURALLY AWARE	CULTURALLY RESPONSIVE
-24 to -10	**-9 to 0**	**1 to 10**	**11 to 17**	**18 to 24**
There is no guidance on engaging diverse learners or culturally responsive teaching in the teachers' materials. Teachers are not encouraged to reflect on their worldviews or their practice. There is no guidance about connecting the curriculum to students' lives. There is no opportunity for cultural responsiveness.	There is a little guidance on engaging diverse learners or culturally responsive teaching in the teachers' materials, but it is mostly on a superficial or symbolic level. It is seen as additive, rather than central to the curriculum and teaching.	There is a little guidance on engaging diverse learners in meaningful culturally responsive ways. The teachers' materials provide guidance on at least one of the following: supplementing curriculum, engaging students in culturally sensitive experiential learning, and making real life connections between the curriculum and students' lives.	There is a lot of guidance on engaging cultural responsiveness. Teachers are presented with activities to reflect on their worldviews and how they see and teach students. There is some guidance on several of the following: supplementing curriculum, engaging students in culturally sensitive experiential learning, and making real life connections between the curriculum and students' lives	There is an abundance of guidance on engaging cultural responsiveness meaningfully throughout the teaching approach, homework, lesson plans, etc. Culturally responsive guidance is clearly marked and presented as essential to effective teaching. Teachers are encouraged to consistently check their own biases and reflect on their practice

MATERIALS AND RESOURCES

CULTURALLY DESTRUCTIVE	CULTURALLY INSUFFICIENT	EMERGING AWARENESS	CULTURALLY AWARE	CULTURALLY RESPONSIVE
-10 to -4	**-3 to 0**	**1 to 4**	**5 to 7**	**8 to 10**
The curriculum likely does not make considerations for accessibility and does not include resources and materials from BIPOC communities.	The curriculum likely makes little consideration for accessibility and does not include resources and materials from BIPOC communities.	The curriculum likely makes some consideration for accessibility and includes some resources and materials from BIPOC communities.	The curriculum likely makes significant consideration for accessibility and includes some resources and materials from BIPOC communities.	The curriculum likely makes significant consideration for accessibility and includes sufficient resources and materials from BIPOC and other marginalized communities.
The academic rigor of the curriculum is highly dependent on the use of inaccessible, White centric materials and resources; these materials and resources are not used to address issues of social justice or BIPOC innovation.	The academic rigor of the curriculum is dependent on the use of inaccessible, White centric materials and resources; these materials and resources are not used to address issues of social justice or BIPOC innovation.	The academic rigor of the curriculum is not dependent on the use of materials and resources; these materials and resources are somewhat used to address issues of social justice or BIPOC innovation.	The academic rigor of the curriculum is not dependent on the use of materials and resources; there are multiple ways that students can access the curriculum and practice STEAM. Materials and resources are used to address issues of social justice and BIPOC innovation.	Accessible materials and resources enhance students' STEAM experience and allow teachers to engage culturally responsive practices. There are multiple ways that students can access the curriculum and practice STEAM. Materials and resources are used to address issues of social justice and BIPOC innovation.

POST EVALUATION: NEXT STEPS

Share your evaluation results! Seriously. Sharing is anonymous and your results allows us to collective community-driven data on our collective impressions of STEAM curricula. This data can help stakeholders understand how to create or supplement curricula.

Once you've completed the collaborative evaluation of your science, technology, engineering, arts and/or math curricula, collectively interpreted your scores, and conducted a debrief meeting as outlined in the "How to Use this Scorecard" section, you may require additional guidance on next steps. Education Justice Research and Organizing Collaborative created a Post-Scoring Toolkit to give you a few ideas. This toolkit was created for the ELA Scorecard, but there are useful next steps that also apply to STEAM disciplines. If you found that your curriculum was culturally responsive and sustaining, please consider sharing it with EJ-ROC so that we may share it with others looking to purchase better materials.

Share your evaluation results!
bit.ly/STEAMscorecardresults

GLOSSARY

BIPOC

Black, Indigenous and people of color.
The term is to highlight the unique relationship to whiteness that Indigenous and Black people have, which shapes the experiences of and relationship to white supremacy for all people of color within a U.S. context.[1]

Brown

While there is not a common definition of Brown people, in this Scorecard Brown refers to people who self identify as Brown which can include Brown Latinx folx, Indigenous folx, and Asian folx (South East Asian, Indian, Middle Eastern folx). It should be noted that some of these identities may overlap (ex. Brown Indigenous Latinx person).

Collaboration

Collective action, working together, group oriented goals, tasks, learning & achievement) through mutual goals, shared responsibility, support/resources, and performance/assessment.

Dominant Knowledge Systems/ Indigenous Knowledge Systems

"Western knowledge systems are built upon the idea of positivism, which is the belief that the most trustworthy source of knowledge is information acquired by the senses and verified by logical, scientific, or mathematical testing. Knowledge that does not come in this way is regarded with a great deal of suspicion. Indigenous knowledge systems, which are based on metaphysical beliefs, tend to view knowledge as much more subjective, and so are not as prescriptive in how they go about acquiring it."[2]

Implicit Bias

The attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner.

Interdependence

The state of being dependent upon one another. Indigenous cultures are based on the worldview that all things in the universe are dependent on each other–humans, land, water, plants, animals. This is in contrast to European worldview of individualism and independence of humans from each other and from nature.

Non-binary

Term used to describe genders that don't fall into one of these two categories: male or female.[3]

Non-western Centric

Reflecting a tendency to interpret the world in ways that are not of European or Anglo-american values and experiences.

Pedagogy

The method and practice of teaching, especially in relation to an academic subject or theoretical concepts.

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3. National Center for Transgender Equality. (October, 2018). Understanding non-binary people: How to be respectful and supportive. Retrieved from https://transequality.org/issues/resources/understanding-non-binary-people-how-to-be-respectful-and-supportive

CRE-STEAM REFERENCES, READING & RESOURCES

STEM

How to Avoid Pitfalls Associated with Culturally Responsive Instruction (link)

Corneille, M., Lee, A., Harris, K. N., Jackson, K. T., & Covington, M. (2020). Developing Culturally and Structurally Responsive Approaches to STEM Education to Advance Education Equity. *Journal of Negro Education*, 89(1), 48-57.

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Sengupta-Irving, T. & Vossoughi, S. (2019). Not in their name: re-interpreting discourses of STEM learning through the subjective experiences of minoritized girls. *Race Ethnicity and Education*, 22(4), 479-501. DOI: 10.1080/13613324.2019.1592835

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ARTS

Acuff, J.B., Hirak, B. & Nangah, M. (2012). Dismantling a master narrative: Using culturally responsive pedagogy to teach the history of art education. *Art Education*, 65(5), 6.

Hanley, M. S. (2011). You Better Recognize!: The Arts as Social Justice for African American Students. *Equity & Excellence in Education*, 44(3), 420-444.

Hunter-Doniger, T., Howard, C., Harris, Renard, & Hall, C. (2018). STEAM through culturally relevant teaching and storytelling. *Art Education*, 71(1), 46-51.

McCarther, S. M., & Davis, D. M. (2017). Culturally Relevant Pedagogy Twenty-Plus Years Later: How an Arts Approach to Teaching and Learning Can Keep the Dream Alive. *American Educational History Journal*, 44(2), 103-113.

Wexler, A. (2018). #BlackLivesMatter: Access and Equity in the Arts and Education. *Art Education*, 71(1), 20-23.

SCIENCE

Decolonizing Science Reading List by Chanda Prescod-Weinstein (link)

Kicking It Up a Notch: Becoming a Culturally Relevant Science Educator by Valerie Butler (link)

Aguilar-Valdez, J. R., LópezLeiva, C. A., Roberts-Harris, D., Torres-Velásquez, D., Lobo, G., & Westby, C. (2013). Ciencia en Nepantla: the journey of Nepantler@s in science learning and teaching. *Cultural Studies of Science Education*, 4, 821.

Bettez, S., Aguilar-Valdez, J., Carlone, H., & Cooper, J. (2011). On negotiating White science: a call for cultural relevance and critical reflexivity. *Cultural Studies of Science Education*, 6(4), 941-950.

Brown, J. C. (2017). A metasynthesis of the complementarity of culturally responsive and inquiry-based science education in K-12 settings: Implications for advancing equitable science teaching and learning. Journal of Research in Science Teaching, 54(9), 1143-1173. https://doi-org.proxy.library.nyu.edu/10.1002/tea.21401

Fikile Nxumalo, F. & kihana miraya ross (2019) Envisioning Black space in environmental education for young children, Race Ethnicity and Education, 22:4, 502-524, DOI: 10.1080/13613324.2019.1592837

Glynn, T., Cowie, B., Otrel-Cass, K., & Macfarlane, A. (2010). Culturally Responsive Pedagogy: Connecting New Zealand Teachers of Science with Their Maori Students. *Australian Journal of Indigenous Education*, 39, 118-127.

Irzik, G., & Nola, R. (2009). Worldviews and their relation to science. *Science & Education*, 18(6-7), 729-745.

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Walls, L., Buck, G. A., & Akerson, V. L. (2013). Race, culture, gender, and nature of science in elementary settings. In J. A. Bianchini, V. L. Akerson, A. C. Barton, O. Lee, & A. J. Rodriguez (Eds.). Moving the equity agenda forward [Electronic Resource]: Equity Research, Practice, and Policy in Science Education (pp. 123-151). New York: Springer Netherlands.

Yoon, J., & Martin, L. A. (2019). Infusing Culturally Responsive Science Curriculum into Early Childhood Teacher Preparation. *Research in Science Education*, 49(3), 697-710. https://doi-org.proxy.library.nyu.edu/10.1007/s11165-017-9647-x

MATH

TODOS Math: https://www.todos-math.org/

The Mo(ve)ment to Prioritize Antiracist Mathematics: Planning for This and Every School Year (2020) (link)

CRMT Lesson Analysis Tool: http://www.mathconnect.hs.iastate.edu/documents/CRMTLessonAnalysisTool.pdf

Culturally Relevant Pedagogy in Mathematics: A Critical Need by Shelly Jones TED Talk: https://www.youtube.com/watch?v=EjLOuUhN6xY

Abdulrahim, N. A., & Orosco, M. J. (2020). Culturally Responsive Mathematics Teaching: A Research Synthesis. *Urban Review: Issues and Ideas in Public Education, 52*(1), 1-25.

Aguirre, J., & del Rosario Zavala, M. (2013). Making culturally responsive mathematics teaching explicit: a lesson analysis tool. *Pedagogies, 8*(2), 163-190. DOI: 10.1080/1554480X.2013.768518

Martin, D. B. (2019). Equity, Inclusion, and Antiblackness in Mathematics Education. *Race, Ethnicity and Education, 22*(4), 459-478.

Kokka, K. (2018). Healing-Informed Social Justice Mathematics: Promoting Students' Sociopolitical Consciousness and Well-Being in Mathematics Class. Urban Education. https://doi.org/10.1177/0042085918806947

Leonard, J., Napp, C., & Adeleke, S. (2009). The Complexities of Culturally Relevant Pedagogy: A Case Study of Two Secondary Mathematics Teachers and Their ESOL Students. *High School Journal, 93*(1), 3-22.

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Ukpokodu, O. N. (2011). How Do I Teach Mathematics in a Culturally Responsive Way?: Identifying Empowering Teaching Practices. *Multicultural Education, 19*(3), 47-56.

TECHNOLOGY

Decolonizing Technology: A Reading List by Beatric Martini (link)

Ashcraft, C., Eger, E. K., & Scott, K. A. (2017). Becoming Technosocial Change Agents: Intersectionality and Culturally Responsive Pedagogies as Vital Resources for Increasing Girls' Participation in Computing. *Anthropology & Education Quarterly, 48*(3), 233-251.

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Scott, K. A. (1), Sheridan, K. M. (2), & Clark, K. (3). (n.d.). Culturally responsive computing: a theory revisited. *Learning, Media and Technology, 40*(4), 412-436.

Vakil, S. & McKinney de Royston, M. (2019). Exploring politicized trust in a racially diverse computer science classroom. *Race Ethnicity and Education, 22*(4), 545-567, DOI: 10.1080/13613324.2019.1592846

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Jordan, S. S., Foster, C. H., Anderson, I. K., Betoney, C. A., & Pangan, T. J. D. (2019). Learning from the experiences of Navajo engineers: Looking toward the development of a culturally responsive engineering curriculum. *Journal of Engineering Education, 108*(3), 355-376.

Khalil, D., Bruce, A. W., & Kier, M. (2019). Designing Culturally Relevant Engineering Challenges: Connecting Equitable Mathematics Teaching Practice with Standards of Mathematical Practice. *Conference Papers -- Psychology of Mathematics & Education of North America*, 297-302.

Leonard, J., Mitchell, M., Barnes-Johnson, J., Unertl, A., Outka-Hill, J., Robinson, R., & Hester-Croff, C. (2018). Preparing teachers to engage rural students in computational thinking through robotics, game design, and culturally responsive teaching. *Journal of Teacher Education, 69*(4), 386-407.

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