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Why Instructional Materials Matter for Maryland Students

The students of Maryland are a vibrant community of diverse learners, including a growing number of multilingual students and students from various racial and cultural backgrounds.1 Instructional materials designed to best serve these students must facilitate enriching, culturally responsive, and language affirming environments for all students.

Students deserve the opportunity to engage with rigorous content that builds a strong foundation for their educational journey and empowers them with essential learning skills. High-quality literacy instructional materials offer students engagement with worthy and complex texts, tasks, and learning experiences which foster critical thinking abilities, language development, and amplify student voice and agency. Additionally, these materials prioritize the affirmation of students' cultural and linguistic identities, attending to inclusive learning communities that connect education to their real world experiences, and provide the support and skill to ensure students with diverse learning needs to thrive.

By aligning with College and Career Readiness standards and research-based approaches, high-quality instructional materials unlock and support knowledge-building that encourages active learning and leads to dynamic demonstrations of knowledge from students. Furthermore, these materials offer support for educators, equipping them with the necessary tools, content knowledge, pedagogical expertise, and research-based practices to effectively engage students and adapt to diverse community and school contexts. With this comprehensive approach, instructional materials in Maryland have the potential to create transformative learning environments that prepare students from kindergarten through graduation for a future of choice and opportunity.

[1] In 2022, Maryland's student population included 33% Black, 33% White, 22% Latinx and 7% Asian students, as well as 12% English learners, 12% students with disabilities, and an increasing proportion who face economic challenges (Maryland Department of Education).

Document Introduction

This framework serves as a valuable resource for educators and stakeholders across the education sector to identify key criteria in truly high-quality instructional materials. It outlines the essential elements of outstanding curricula and offers clear guidelines on the necessary instructional shifts and educator supports needed to foster meaningful learning experiences for students. To deliver the world-class education that the Blueprint for Maryland's Future envisions, educators and leaders can rely on this framework in service of identifying research-based, high-quality materials that are necessary to provide students with rigorous instruction, nurture spaces that affirm their cultural and linguistic identities, and ensure students' continued progress and success each year.

This framework is grounded in extensive research aimed at defining the content, instructional practice, and instructional design present in high-quality instructional materials. These research-based elements are central to the criteria within this framework and critical to support the kinds of learning experiences that Maryland students deserve.

Despite its strengths as a resource for identifying high-quality instructional materials, there are limitations for how this framework can be used. While the document presents crucial guidelines, it is NOT intended to be exhaustive in addressing all elements of instructional materials and practices needed to create an equitable experience for students. Additionally, this document is NOT a rubric, meaning it does not provide a checklist or a scoring system for evaluation of instructional materials. Instead, it offers guidance on the essential components of high-quality materials, encouraging educators to exercise professional judgment and adapt to their specific educational context. From this framework, a complimentary ELA/literacy rubric has been designed to make these criteria measurable in service of evaluating the quality of instructional materials.

It is also important for educators and leaders to recognize any and all humanizing considerations beyond the framework that may be necessary based on the unique students, contexts of classrooms, and school/district conditions in their review and selection of high-quality materials using this framework. Overall, this framework serves as a roadmap, empowering educators to select and utilize the instructional materials that foster inclusivity, rigor, and relevance, ultimately resulting in enhanced student learning outcomes for all students.

DOCUMENT ORGANIZATION

This document, intended for use when considering K-12 ELA/literacy core instructional materials, is organized into four categories (Designed to Affirm Students; Grade-Level and Standards-Aligned; Instructional Design; and Educator Supports), with domains that highlight Key Criteria within each subsection.

While specific categories have been included for Culturally Responsive-Sustaining Pedagogy and Language Affirming Instruction, related considerations for affirming students are woven throughout the framework. Similarly, considerations for diverse learning needs and Universal Design for Learning have been embedded throughout to reflect the way that these practices must be interlaced in thinking about content, instructional practice and support for educators.

A collection of research and scholarship used to inform this framework is included as an Appendix.

Key Criteria for High-Quality Instructional Materials

DESIGNED TO AFFIRM STUDENTS

Affirming students creates opportunities for cultural and linguistic backgrounds to be an asset and a source of validation in the learning experience. In addition to a foundation of grade-level content, high quality instructional materials must prioritize instructional practices that affirm students' cultural and linguistic backgrounds and support students with a range of diverse learning needs to thrive through science. This includes developing culturally responsive-sustaining learning communities that affirm who students are and the cultural identities they bring with them; use science as a tool for building cultural competence, perspective taking, and social, political, and ecological thinking and engage in science in ways that foster relationships, community, and a sense of pride and understanding of students' own contexts. Science instruction must also intentionally affirm students' languages and language practices through a focus on developing multilingualism and ensuring that all students can meaningfully access and engage with science ideas and practices using their unique linguistic assets. Through these instructional choices, materials have the potential to ensure that all learners find success in science and can cultivate identities as scientists and engineers.

Key Criteria for Culturally Responsive-Sustaining[2] Instruction

- **Affirm & Center Students:** Instructional materials affirm, engage, and center past and current knowledge of Black/African, Indigenous, Brown, and non-Western literary expressions and highlight multilingualism. Instructional materials are designed to encourage students to anchor learning in their individual experiences, backgrounds, and cultural knowledge to support and further literacy work. This includes (all of the following):
    a. regular opportunities for students to share about who they are and what they know, bringing their unique funds of knowledge[3] to their literacy experiences;
    b. reflection and conversation within the context of the text or topic under study that affirm students' identities and experiences;
    c. instructional materials engage students in authentic and meaningful activities (scenarios, investigations, tasks, etc.) that reflect both the authenticity of the discipline (i.e., how science is done in a variety of real-world contexts, including those that challenge canonical, Western-dominant approaches to science) and authenticity to students' lived experiences.
- **Science as a Tool for Civic Engagement:** Instructional materials consistently include phenomena and tasks that prompt students to apply and develop their civic engagement skills and examine social contexts and current events, using science to question the world and the current status quo.

[2] This conceptualization of culturally responsive-sustaining instruction is built on the evidence from its predecessors—culturally relevant, responsive, and sustaining pedagogies. This scholarship underscores the importance of leveraging the diverse backgrounds of students as assets in the classroom that can and should be sustained through intentional instructional design. For more information about relevant scholarship, please see the citations section in the Appendix.

[3] Moll, L. C., Amanti, C., Neff, D.,& González, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. Theory Into Practice, 31(2), 132–141

- **Criticality:** Instructional materials require that students carefully consider the interactions between social, structural, political, and ecological systems; observed phenomena and problems; and how science knowledge and practice operate in different contexts. This includes:
    a. considering how human-driven systemic factors that have led to the occurrence of phenomena and problems;
    b. questioning what elements of science practices have led to the specific data, evidence, and narratives related to a given phenomenon or problem;
    c. considering timelines, and how different systemic elements are implicated at different timescales.
- **Real World Connections:** Instructional materials consistently connect with students' lives, future goals, communities, and the world and nurture ways to engage in their own communities and beyond. This includes (all of the following):
    a. use scientific phenomena and tasks to connect to current events;
    b. engage in collaborative tasks and/or projects that involve real-world problem-solving through meaningful interactions with peers and their local communities;
    c. center and include structures (e.g., tasks, classroom activities, routines, assignments, etc.) to explore scientific phenomena from current events and data relevant to students' lives and communities[4] so that students see themselves in the tasks and understand how they relate to their context and promote a sense of belonging;
    d. opportunities for students to reflect on how science phenomena, problems, and activities impact themselves, their families, and communities, and how their specific communities might shape the phenomena/problems/activities; and
    e. include teacher guidance to support students in developing science and engineering practices and disciplinary knowledge relevant to their academic and professional goals;

Key Criteria for Language Affirming Instruction

- **Multilingualism in Science:** Instructional materials are deliberately designed to honor and build upon students' language(s) as an asset, encouraging students to use their linguistic repertoire to communicate with one another via reading, writing, speaking, and listening while engaging in literacy. This includes (all of the following):
    a. sustained oral and written communication, including explicit encouragement to utilize a range of language practices and registers, and to use their full language repertoire through translanguaging5 so all students express themselves in a language they are

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[4] Tate, W. F. (1995). Returning to the root: A culturally relevant approach to mathematics pedagogy. *Theory into practice*, *34*(3), 166-173.

[5] García, O., Johnson, S. I., & Seltzer, K. (2017). *The Translanguaging Classroom: Leveraging Student Bilingualism for Learning*. Caslon. For more see [Translanguaging Strategies](), English Learner Success Forum.

comfortable with while working to learn literacy content and meet language objectives in the target language;

b. building vocabulary and understanding of new concepts in English and home language(s), including use of social and academic vocabulary;

c. making cross-linguistic connections, including identifying and comparing similarities and differences between home language(s) and English (e.g., cognates) or registers and registers of instruction;

d. stating clear and specific integrated three-dimensional goals that emphasize the ways students use language for learning and communicating meaning in science5;

e. introducing students to new language after students have developed conceptual understanding, in order to understand and communicate science ideas5;

f. materials make the purpose of using language to communicate about scientific phenomena clear to students and teachers5;

g. offering ongoing discussion opportunities for students to listen actively, express, revisit, and refine their three-dimensional understanding and language over time5; and

h. offering ongoing opportunities for students to revisit and refine their three-dimensional understanding and language over time through reading, viewing, writing, and representing5;

- **Phenomena/Text Selection to Support Language Development:** Instructional materials utilize texts that (all of the following):

  a. include authentic language;

  b. contain rich vocabulary and syntax;

  c. are written in home languages, when possible, and high-quality (e.g., not poor quality translations); and

  d. are formatted in ways that support meaning making and language development (e.g., text engineering).

GRADE-LEVEL AND STANDARDS ALIGNED

Grade-level, standards-aligned opportunities to develop and demonstrate sense-making with the three dimensions in science serves as a necessary foundation for equitable student experiences in the classroom. Engaging with sophisticated disciplinary content, concepts, and practices from kindergarten through graduation sets students on a path to empowered lives, and instructional materials must be designed so that all students have access to this essential science work. This includes ensuring all students are empowered by to make sense of phenomena and problems that are meaningful and compelling, and doing so in ways that build sophisticated understanding and use of science and engineering practices, disciplinary core ideas, and crosscutting concepts.

Key Criterial for Sense-Making

- **Phenomenon- or Problem-driven Learning and Performance:** Instructional materials center student learning around making sense of specific occurrences (phenomena) and addressing situations people want to change (problems).
    a. Compelling and problematized phenomena and/or problems are presented to students to drive sense-making. Phenomena used in instructional materials are specific, meaningful to particular communities, developmentally appropriate, and of the appropriate scope to drive sense-making and learning of the targeted standards. Instructional materials provide students opportunities to engage with a range of types of phenomena, including everyday, societally relevant, culturally significant, and contemporary scientific phenomena.
    b. Student questions about phenomena/problems, and experiences (prior and those cultivated in the moment in class) related to the phenomena/problems, motivate student sense-making and/or problem-solving.
    c. Instructional materials are organized to center and facilitate student sense-making about phenomena and problems. From the student perspective, they engage in instructional activities because those activities help them answer questions they have about the phenomenon, and each activity subsequently raises new questions that further lessons will address.
- **Three Dimensions Development:** Instructional materials build student understanding of grade- appropriate elements of science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs) that are intentionally coherent with the phenomena and/or problem(s) driving the unit. Instructional materials offer expansive ways for students to engage with and develop the three dimensions, including special attention to—and explicit opportunities to engage with— multiple ways of knowing and doing science. This can include different cultural norms across scientific disciplines as well as engaging with a range of culturally-grounded instantiations of the SEPs, DCIs, and CCCs.
- **Nature of Science Development:** Nature of Science expectations in the NGSS offer an explicit route to building an understanding of criticality in science. Instructional materials should explicitly build students understanding of nature of science elements, explicitly connected to understanding:
    a. how specific scientific understandings have been constructed,
    b. who has been included and excluded in scientific activities and communication of findings,
    c. impact of how science has been, and is, done on a range of human and non-human communities and environments.
    d. The connection between the nature of science and problem/question definition and critical interpretation of findings.
- **Nature of Science and Three Dimensions Integration:** Instructional materials organize learning around using the SEPS, CCCs, DCIs, and nature of science together in service of sense-making.

- **Hands On:** Instructional materials provide students with the opportunity to regularly take part in hands-on investigation, modeling, and engineering. Activities emphasize student scientific actions, providing students opportunities to collect data, display understanding through models, and develop solutions based on rigorous criteria.

Key Criteria for Coherence

- **Lesson and Unit Coherence:** Lessons and units build on prior lessons and experiences by addressing questions raised in previous lessons, and leading students to pose new questions that will be explored in subsequent lessons. In doing so, the materials build understanding toward a defined set of three- dimensional expectations;
- **Skill Building Coherence:** SEP and CCC skill building and assessment in builds progressively K-12 with the inclusion of periodic formative assessment tools;
- **Math and ELA Alignment:** Students are given opportunities and supports to develop and engage with grade-appropriate math and ELA content and practices;
- **Scientific Accuracy:** Instructional materials use scientifically accurate and grade-appropriate scientific information, phenomena, and representations to support students' three-dimensional learning.

INSTRUCTIONAL DESIGN

Instructional materials must support meaningful engagement for all students in order to be deemed high- quality. It is through this intentional design that these resources contribute to learning communities where students develop deep understanding of the natural and designed world; are authentically engaged as scientists and engineers; have the support they need; and regularly demonstrate their learning in dynamic ways.

Key Criteria for Student Agency

- **Cultivate Joy:** Instructional materials inspire happiness, excitement, and a sense of fun/play in students and communities and emphasize phenomena and sense-making that inspire wonder and appreciation. Instructional materials uplift diverse cultures via asset-oriented (rather than victimized or deficit) narratives, with an emphasis on those cultures that have been minoritized.
- **Solutions-Oriented:** Instructional materials focus students on positive action and impact in communities, including providing students with opportunities to cultivate joy in their communities directly.
- **Imaginative and Creative Risk-taking:** Instructional materials encourage students to think outside the box, addressing imaginative and creative scenarios with non-routine thinking where the emphasis is on sound reasoning and generating and questioning new ideas that emerge.
- **Choice and Interest:** Instructional materials encourage students to choose and pursue phenomena/problems/approaches that interest them.

- **Feelings of Success:** Instructional materials provide students with opportunities to see that they have accomplished something meaningful, both in their own learning as well as for themselves, their families and communities, or more broadly.

Key Criteria for Leveraging Funds of Knowledge

- **Student Idea Engagement:** Instructional materials provide opportunities for students to express, clarify, justify, interpret, and represent their ideas and to respond to peer and teacher feedback orally and/or in written form as appropriate.
- **Storycatching**: Instructional materials provide both the infrastructure and guidance for surfacing students' experiences, values, and perspectives, as well as guidance for how to incorporate/leverage these facets of student experience into meaningful instructional materials implementation.
- **K-12 Progressions:** Instructional materials identify and build on students' prior learning in all three dimensions, including providing the following support to teachers, including by:
    a. Explicitly identifying prior student learning expected for all three dimensions;
    b. Clearly explaining how the prior learning will be built upon.
- **Developmentally Appropriate Transfer:** Instructional materials carefully attend to, and build, transfer of understanding of the three dimensions over the course of programs. This includes opportunities to practice and surface students' ability for increasingly distal application of their thinking, metacognitive opportunities to reflect on how what they are learning is applicable beyond the immediate learning contexts, explicit use of SEPs and CCCs to foster transfer, and explicit opportunities to build more robust schemas by making connections across disparate learning experiences over time.

Key Criteria for Progress Monitoring and Supporting Students

- **3D Performance Monitoring:** Instructional materials embed frequent opportunities to monitor and develop students' progress of scientific sense-making using the three dimensions and nature of science. These opportunities are fully coherent with instructional design, implying that they reflect students' opportunities to learn, and the same criteria as instructional materials, as appropriate to the scope and nature of the assessment(s). This includes (all of the following):
    a. consistent multidimensional assessment opportunities that center making sense of phenomena and addressing problems with the three dimensions and nature of science.
    b. embedded and consistent formative assessment practices to surface student understanding and inform instructional decision-making;
    c. varied and multiple means of surfacing sense-making with multiple dimensions that coherently measure and signal what is most valued about student learning in science, including attention to culturally and linguistically responsive practices;
    d. routine opportunities to demonstrate understanding at a range of complexity, including simple checks on understanding and more complex performance tasks at appropriate intervals;

e. routine opportunities to surface data about students' experience, and to triangulate this with performance information to inform instruction.

- **Metacognitive Processes:** Instructional materials intentionally develop and surface students' metacognition by directly teaching and supporting students to monitor understanding while engaging in science learning. This includes setting goals; self-monitoring growth; opportunities to revisit student models, explanations, and designs as part of the process of intentional reflection; reflecting on the impact of students' choices and ongoing development as scientists and engineers. Materials provide strategies to help students understand the relationship between the three dimensions and the variety of language used (everyday, science-specific, and home language, etc.)[6].

- **Asset-Oriented Feedback:** Instructional materials provide frequent opportunities for constructive, asset-oriented feedback that is designed to "feedforward": to explicitly support students' progress and advance multidimensional understanding. This includes (all of the following):

  a. opportunities for self-, peer- and teacher-provided cycles of feedback;

  b. mechanisms and support for recognizing and valuing facets of student learning and diverse sense-making repertoires, and leveraging these features as part of feedback;

  c. normalizing "wrong answers" and affirming effort and growth; and

  d. providing adequate, supportive, and explicit feedback to build understanding of DCIs, SEPs, and CCCs in the context of phenomena and problems.

  e. explicit connections between students' surfaced understanding and next steps within instructional materials.

  f. providing feedback in ways that continue to build student confidence and agency while creating more sophisticated science thinkers.

- **Diverse Supports and Scaffolds:** Instructional materials provide guidance for teachers to support differentiated instruction and assessment by including:

  a. supportive ways to access instruction, including appropriate linguistic, visual, and kinesthetic engagement opportunities that are essential for effective science and engineering learning and particularly beneficial for multilingual learners and students with disabilities.

  b. extra support (e.g., phenomena, representations, tasks) for students who are struggling to meet the targeted expectations, including ways to build needed foundational skills in the context of current instructional goals.

  c. extensions for students with high interest or who have already met the performance expectations to develop deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts.

[6] English Learner Success Forum. Guidelines for Improving Science and Engineering Materials for Multilingual Learners

d. supports that focus on meeting students where they are without sacrificing grade-level content by focusing on “scaffolding up” to grade-level expectations, rather than using scaffolds or supports to limit engagement with grade-level content.

Disciplinary Literacy: Instructional materials provide explicit appropriate supports for learners to develop their abilities to read, write, speak, and listen in ways that are appropriate to three-dimensional science.

EDUCATOR SUPPORTS

To promote facilitation of meaningful learning experiences for all students, instructional materials ensure effective support for educators to engage all students in rigorous, meaningful content through reflection; content and pedagogical content knowledge; and understanding of research-based practices. In addition, resources are thoughtfully designed for ease of use and fit to community context.

Key Criteria for Educator Knowledge

- **Examine Self:** Instructional materials support teachers in routinely examining their own identities, belief and value systems, and biases to help them understand how these factors might influence instructional choices. This may include reflection prompts, examples of educator thinking, or embedded professional learning. Instructional materials encourage this both generally as well as in specific instructional contexts (e.g., when a non-traditional evidence source is presented in the materials, when students are encouraged to engage in intergenerational dialogue, etc).

- **Pedagogical Content Knowledge:** Instructional materials explicitly support teachers in building students’ science understanding by helping educators understand how students learn science. This includes:

  a. Providing explanations, examples, additional conceptual information, and related phenomena to support teachers in building their own knowledge of the phenomena, problems, SEPs, DCIs, and CCCs targeted;

  b. Provide explicit guidance for instructional strategies and routines that support authentic student sense-making (e.g., how to surface student questions that drive activities in the unit within planned instruction); and

  c. Provide explicit guidance for instructional strategies and routines that are consistent with how students learn science (e.g., rather than simply providing teachers with common misconceptions, provide information about what experiences young children often have that lead them to believe one thing, and how to use that facet of understanding to build a more accurate and complete understanding in grade-appropriate ways);

Key Criteria for Supporting Relationships building and Productive Classroom Culture

- **Students' Linguistic and Cultural Assets:** Instructional materials support educators in understanding how to surface and value diverse sense-making repertoires, and how to leverage students' linguistic and cultural assets in service of more sophisticated scientific sense-making with the three dimensions. This includes:
    a. Explicitly prompting (and providing integrated structures for) educators to learn about and integrate the knowledge, strengths, and resources of students, families, and the community - especially those who have been historically marginalized;
    b. Providing diverse examples of how different student experiences and language can be leveraged within specific instructional contexts; and
    c. Including explicit prompts and supports for surfacing student assets within teacher guides or other facilitator materials;

- **Inclusive Classroom Environments.** Instructional materials include specific guidance, instructional strategies, and routines for cultivating classroom cultures within which all students can have a voice and feel a sense of belonging. This includes structures for ensuring all students can share their ideas, opportunities for students to see their ideas as valued elements/expertise within the science classroom setting, creating opportunities for students to recognize self and peer assets while celebrating diversity of experiences, and disrupting patterns that explicitly foster ranking and comparisons among students.
- **Peer and Adult Relationship Building.** Instructional materials include specific guidance, instructional strategies, and routines for engaging in science learning in ways that cultivate a range of productive relationships for students. This may include guidance for productive collaborative experiences, structures for providing feedback in caring ways, ways to storycatch to learn about student experiences in ways that can show up in instructional experiences, etc.

Key Criteria for Supporting Principled Adaptation to Local Contexts and Specific Student Experiences

- **Related and Alternative Phenomena:** Instructional materials provide guidance for how to identify and use alternative phenomena and problems as part of instructional activities, including locally relevant and compelling phenomena/problems.
- **Surfacing Student Experiences.** Instructional materials include explicit structures for collecting student interest and experience data, and to triangulate this with performance/proficiency data to inform possible needed adaptations of materials.
- **Student-Centered Extensions and Alternatives.** Instructional materials provide guidance for possible extension activities, alternative investigations, or design projects that allow for student choice and adaptation to specific communities and students. This may include structures and guidance, with opportunities for teachers and students to have complete autonomy over content, or this may include more structured opportunities, with specific elements open to choice and adaptation.

- **Clear guidance on Constant and Variable Features.** Instructional materials are designed such that they assume some local adaptation will be needed to authentically support diverse learners. Instructional materials explicitly support teachers in understanding which elements of the materials should not be adapted (or should be done so very carefully), and which elements have been designed such that teachers and students can modify them with great success (e.g., to connect with local resources and priorities, to be appropriate to available time for instruction, etc.)

Key Criteria for Usability

- **Design and Functionality:** Instructional materials are designed to support ease of student and teacher use. This includes (all of the following):
    a. a visually appealing design with an organized and logical format;
    b. materials that are appropriately paced;
    c. clear and concise educator-facing guidance;
    d. a variety of ways to engage with the content, including leveraging current technology and tools;
    e. manipulatives are well organized, with an emphasis on ease of setup;
    f. hands-on activities include appropriate guidance.
- **Program Coherence**: Core instructional materials work in concert with (or have the potential to work in concert with) additional supplemental science materials (e.g., Maryland Environmental Literacy Standards Framework, local projects, school-based science/STEM initiatives). This includes, aligned and research-based content and instructional approaches across materials