Publisher's Response to EdReports Review of the Cereal City Science K-5 Science Curriculum

Cereal City Science (CCS) is dedicated to providing a comprehensive K-8 science curriculum designed to meet the Next Generation Science Standards (NGSS) and to support the learning objectives specified in *A Framework for K-12 Science Education*. As recommended in the Next Generation Science Standards, the CCS curriculum engages students in the science and engineering practices and crosscutting concepts to discover and learn challenging disciplinary core ideas while figuring out phenomena and explaining the world around them. Cereal City Science's interdisciplinary approach weaves together opportunities to apply technology, mathematics, reading, writing, and language to real-world situations as students deepen their understanding and knowledge in science and engineering.

The EdReports review indicates many areas where the Cereal City Science K-5 Science Curriculum excels. Across all grade levels, the review found that the Cereal City Science K-5 Science Instructional Materials:

- "consistently integrate the three dimensions." (1A.i)
- "consistently support meaningful student sensemaking." (1A.ii)
- "connect phenomena/problems to grade-level Disciplinary Core Ideas." (1D)
- "present phenomena/problems to students as directly as possible." (1E)*
- "have an intentional sequence where student tasks increase in sophistication." (2A.ii)
- "Incorporate all grade-level [DCIs] for Engineering, Technology, and Applications of Science." (2D.iv)
- "Incorporate all grade-level appropriate SEPs within each grade." (2E.i)
- "incorporate all SEPs across the grade band." (2E.ii)
- "incorporate all grade-band Crosscutting Concepts." (2F)

*A rating of 1 was received for grade 4 for this element "present…in multiple instances."

Criterion	K	1	2	3	4	5	Possible
1.1: Three-Dimensional Learning							
1a. Materials are designed to integrate the Science and Engineering Practices (SEP), Disciplinary Core Ideas (DCI), and Crosscutting Concepts (CCC) into student learning.							
i. Materials consistently integrate the three dimensions in student learning opportunities.	4	4	4	4	4	4	4
ii. Materials consistently support meaningful student sensemaking with the three dimensions.	4	4	4	4	4	4	4
1b. Materials are designed to elicit direct, observable evidence for three-dimensional learning.	0	0	0	0	0	0	4
1c. Materials are designed to elicit direct, observable evidence of three-dimensional learning.	2	4	2	2	2	2	4
1.2: Phenomena and Problems Drive Learning							
1d. Phenomena and/or problems are connected to grade-level Disciplinary Core Ideas.	2	2	2	2	2	2	2

Criterion	K	1	2	3	4	5	Possible
1e. Phenomena and/or problems are presented to students as directly as possible.	2	2	2	2	1	2	2
1f. Phenomena and/or problems drive individual lessons or activities using key elements of all three dimensions.	1	1	1	1	1	1	2
1g. Materials are designed to include both phenomena and problems.							
1h. Materials intentionally leverage students' prior knowledge and experiences related to phenomena or problems.	1	0	1	1	0	1	2
1i. Materials embed phenomena or problems across multiple lessons for students to use and build knowledge of all three dimensions.	2	2	2	0	2	0	4
2.1: Coherence and Full Scope of the Three Dimensions							
2a. Materials are designed for students to build and connect their knowledge and use of the three dimensions across the series.							
i. Students understand how the materials connect the dimensions from unit to unit.	0	1	1	1	0	1	2
ii. Materials have an intentional sequence where student tasks increase in sophistication.	2	2	2	2	2	2	2
2b. Materials present Disciplinary Core Ideas (DCI), Science and Engineering Practices (SEP), and Crosscutting Concepts (CCC) in a way that is scientifically accurate.*	0	1	2	1	2	2	2
2c. Materials do not inappropriately include scientific content and ideas outside of the grade-level Disciplinary Core Ideas.*	2	2	0	0	1	1	2
2d. Materials incorporate all grade-level Disciplinary Core Ideas.							
i. Physical Sciences	2	1	2	2	0	0	2
ii. Life Sciences	2	0	2	0	2	2	2
iii. Earth and Space Sciences	2	2	2	2	0	0	2
iv. Engineering, Technology, and Applications of Science	2	2	2	2	2	2	2
2e. Materials incorporate all grade-level Science and Engineering Practices.							
i. Materials incorporate grade-level appropriate SEPs within each grade.	4	4	4	4	4	4	4
ii. Materials incorporate all SEPs across the grade band.	4	4	4	4	4	4	4
2f. Materials incorporate all grade-band Crosscutting Concepts.	8	8	8	8	8	8	8
2g. Materials incorporate NGSS Connections to Nature of Science and Engineering.	1	1	1	2	2	2	2

Cereal City Science appreciates the thorough review of our K-5 Science Curriculum by EdReports and their acknowledgement of our program's numerous strengths. However, we join other publishers in expressing concern that the review criteria seem to encourage a standardized approach to teaching the NGSS, rather than allowing for instructional flexibility and a student-driven approach that provides opportunities to respond to unique experiences, questions, and the needs of learners.

The EdReports review criteria, for instance, require every lesson to be explicitly driven by a phenomenon or problem that incorporates the three dimensions. In contrast, our curriculum includes lessons guided by students' own driving questions about the phenomenon or problem. The examples cited in the review, we contend, are indeed driven by students' questions about the phenomenon/problem, enabling them to obtain information, collect data, and build understanding to ultimately explain the overarching phenomenon or develop solutions to the problem. The "What We Think" chart (i.e. Driving Question Board) is a classroom tool used throughout every unit to help students track their questions, document their evolving understanding, and connect their learning back to the central phenomenon or problem. Moreover, while the review asserts that in some of these instances, the curriculum fails to provide students opportunities to connect their learning back to the phenomenon or problem, the class actually revisits a "What We Think" chart (i.e. Driving Question Board) at the end of each lesson to discuss and make connections in the “What We Figured Out” and “How Does The Help Us to Figure Out the Phenomena/Solve the Problem?” columns of the chart.

We wish to further emphasize that each lesson in our curriculum serves a deliberate purpose - whether it progresses the unit storyline or enables students to gather evidence and information needed to understand the unit’s anchoring phenomenon or problem. While not every lesson may explicitly introduce a new phenomenon at the outset, all lessons facilitate critical steps in the investigative process. Our approach acknowledges that a student-driven science learning experience necessitates inherent flexibility, allowing educators to address the questions and needs that organically emerge as students engage with real-world phenomena and problems and develop a deep understanding of science.

Effective assessment is a critical component of our approach, as it enables teachers to monitor student progress, provide feedback, and adjust instruction to support student learning.

We find that the EdReports review teams were inconsistent in their evaluations of our formative and summative assessment opportunities. They appeared to focus primarily on our student journals and student journal answer keys as their sole source for formative assessment, overlooking the numerous opportunities noted in the “Unit at a Glance” and at the end of each lesson. Additionally, the reviewers pointed out that our summative assessments did not cover all assessable elements. However, they seemed to limit their consideration to the post-assessments conducted at the end of a unit, disregarding other assessment tools embedded in the curriculum. We maintain that student-generated artifacts, such as initial models to final models, student discourse, and presentations, can serve as valuable methods for assessing student learning and understanding. These opportunities provide a comprehensive picture of student mastery and should be taken into account when evaluating the effectiveness of our curriculum’s assessment system.

Conclusion

In conclusion, Cereal City Science appreciates the thorough review conducted by EdReports and the recognition of the many strengths in our K-5 science curriculum, including the consistent integration of three-dimensional learning, the use of phenomena and problems to drive student learning, the accurate presentation of DCIs, SEPs, and CCCs, the appropriate grade-level alignment of the content, and the comprehensive nature of the program.

While we respect the perspective of the EdReports reviewers, we maintain that our curriculum is intentionally designed to provide flexibility for teachers to adapt instruction to the needs and questions of their students. Each lesson connects to the overarching phenomenon/problem and plays an important role in building student understanding and skills as they investigate phenomena and problems over the course of a unit. Our approach empowers teachers to be responsive to students’ emerging questions and ideas through discussion and sense-making activities that continuously connect learning back to the anchoring phenomena and problems.

As an organization committed to continuous improvement, we will thoughtfully consider the specific examples and suggestions provided in the EdReports review to further strengthen our curriculum and additional support for teachers, particularly in the area of formative assessment and providing additional tools and opportunities for students who lack understanding. We remain dedicated to publishing a high-quality, NGSS-designed curriculum that promotes active, inquiry-based science learning for all students.