

## **Publisher’s Response to EdReports Review of *HMH Science Dimensions*® Grades 6-8**

In the opinion of the program authors and advisors and of Houghton Mifflin Harcourt, the EdReports review of *HMH Science Dimensions Grades 6–8* is ineffective as a tool to assess an NGSS program.

Our author and advisor team includes several writers from the Next Generation Science Standards (NGSS) team, among them Cary Sneider and Peter McLaren. Their responsibility was to ensure that *HMH Science Dimensions Grade 6–8* met the expectations of NGSS, based on their expertise as drafters of the standards. They have asked to participate in this Publisher’s Response, as indicated with attributed quotations.

Sneider additionally served as a consultant in engineering education to assist the NRC in development of A Framework for K–12 Science Education and is currently a Visiting Scholar at Portland State University and on the National Assessment Governing Board. McLaren’s other roles include serving as Director of State and District Policy at Achieve, Inc., and as Science and Technology Specialist at the Rhode Island Department of Education. He is currently Executive Director of Next Gen Education, LLC.

### **1. EdReport’s *Science Quality Instructional Materials Rubric: Grades 6-8 Evidence Guide* is poorly documented and is unconnected to the research base of the NGSS, its writers, and the community of teacher practitioners implementing the NGSS.**

Sneider and McLaren note that EdReports’ review is based on a rubric developed internally by EdReports, rather than on a tool informed by the writers of the standards themselves and by many teacher practitioners, such as *The Primary Evaluation of Essential Criteria (PEEC) for NGSS Instructional Materials Design* (Achieve, 2017). They go on to say:

*“EdReports’ ‘Evidence Guide’—at 119 pages in length—has been cobbled together with quotes from many different documents, including several that date from prior to the release of the NGSS. We could find no list of references in this document, so we could not examine the reports and studies on which the document is based.”*

### **2. EdReports’ review document is inappropriately rigid, in contrast to the NGSS, which celebrate the need for flexibility and variety in achieving the instructional shifts necessary.**

Sneider and McLaren continue:

*“Our impression of the document is that it is unnecessarily rigid in its requirements, in contrast to the intent of the NGSS, which is described in the introduction to the NGSS as follows:”*

*The NGSS are standards, or goals, that reflect what a student should know and be able to do; they do not dictate the manner or methods by which standards are taught. The PEs are written in a way that expresses the concept and skills to be performed but still leaves curriculum and instructional decisions to states, districts, schools, and teachers. The PEs do not dictate curriculum; rather they are coherently developed to allow flexibility in the instruction of the standards. While the NGSS have a fuller architecture than traditional standards—at the request of states, they do not need to begin implementation by “unpacking” the standards—the NGSS do not dictate or limit curriculum and instructional choices. (Introduction to the NGSS, p. xiv)*

Even in describing the instructional shifts of the NGSS, the PEEC is very explicit that “less” does not mean “never” and “more” does not mean “always.” Sneider and McLaren indicate that there are sound reasons for this flexibility:

*“For a curriculum to be coherent from the students’ point of view and to reflect good pedagogical practices, a rigid set of guidelines is counterproductive. It is sometimes better to emphasize one or two dimensions rather than all three at the same time—as long as three dimensions are included in an entire lesson, which may span several days of instruction.”*

To the contrary, EdReports review frequently faulted **HMH Science Dimensions Grades 6–8** for not including every dimension in every location, even down to individual formative assessment questions.

In response, Sneider and McLaren say the following:

*“It is unrealistic for instructional materials to include every possible aspect of every dimension. For example, in Appendix F on Science and Engineering Practices, we learn that*

*The practices matrix, described in this section, lists the components of each practice as a bulleted list within each grade band. As the performance expectations were developed, it became clear that it’s too much to expect each performance to reflect all components of a given practice. The most appropriate aspect of the practice is identified for each performance expectation. (Appendix F, page 3)*

*“We wish to remind those considering the EdReports review that the only ‘assessable’ part of the NGSS document is the Performance Expectations. We would also point out at several points in the introduction to the NGSS and in Appendix A that achievement of the Performance Expectations is expected at the **conclusion of instruction**. In the case of **HMH Science***

*Dimensions Grades 6–8, that means at the end of each module. Performance Expectations can only be fully assessed with performance assessments; and these are provided throughout the series, as the EdReports reviewers have actually noted themselves.*

*“The information in the foundation boxes and the appendices of the NGSS are there to help teachers and instructional materials developers understand the origin and intent of the Performance Expectations, not to mandate that they incorporate every subconcept and related behavior into every lesson. Doing so would result in a set of instructional materials that are so fully packed as to lose coherence and focus.”*

**3. EdReports’ insistence that an explicit sequence should be mandated by the publisher for Grades 6–8 is inappropriate and in direct opposition to the structure of the NGSS the need for state and local flexibility.**

In a number of places in the EdReports review, *HMH Science Dimensions* is criticized for failing to provide guidance on a sequence of modules.

But, according to the introduction to the NGSS, “A real innovation in the NGSS is the overall coherence. As such, the PEs (the assessable component of the NGSS architecture) can be arranged within a grade level in any way that best represents the needs of states and districts without sacrificing coherence in learning the DCIs.” (Introduction to the NGSS, p. xviii)

To that evidence of the intent of the NGSS, Sneider and McLaren add the following:

*“Appendix K in the NGSS offers several different pathways through the NGSS, and various states that have adopted the NGSS or similar standards have their own recommendations.”*

Sneider and McLaren also note that for HMH to unilaterally dictate the sequence of instruction would be in violation of the principles of local control that are foundational to the public education system of the United States:

*“In light of the importance of state and local choice, it is simply not appropriate for Houghton Mifflin Harcourt to recommend a given order in which the modules should be presented. On the other hand, there is a specific sequence of units within each module and lessons within each unit that build on prior student accomplishments. Even a glance at module and lesson topics illustrates that the sequence is in order of increasing sophistication.”*

**4. The three “Scientific Inaccuracies” noted by EdReports reviewers are not errors but rather situations in which they believe a student or teacher might possibly (but not necessarily) gather a misconception from a small detail of the presentation of a concept.**

Two of the alleged inaccuracies relate to the wording of sample answers available only in the teacher's edition.

In one, students are asked how they could make a balloon-powered model boat go farther. The answer suggests that adding more air to the balloon will add more potential energy of the system. This is not an erroneous statement, but EdReports' review faults it for not specifically indicating that the increased potential energy stored is through the expanding elastic material of the balloon.

In another, teachers are provided a question prompt about whether changes in volume would affect the density of some putty students had been experimenting with. EdReports objected to this question because students might mistakenly assume the volume of the putty changed upon stretching. This also is not an error, but a hypothetical question about a hypothetical scenario.

The final case is the only one in student materials. It is a photo illustration, with "plus" and "minus" charges on before-and-after photos of a girl rubbing a balloon on her hair. Because the "after" view shows multiple "plus" charges on the hair, EdReports' reviewers assumed students would be misled into believing positive charges from the balloon moved onto the hair, even though the reviewers acknowledge the correct explanation is in the caption accompanying the illustration.

## **Conclusion**

While we appreciate EdReports' efforts and feedback, in light of the preceding evidence, we at HMH remain convinced that ***HMH Science Dimensions Grades 6–8*** truly and comprehensively embodies the NGSS. Nevertheless, we are committed to continual improvement, and are embarking upon a revision to include our consideration of EdReports' feedback while maintaining adherence to the letter and intent of the NGSS.