Publisher's Response to EdReports.org Evaluation of Discovery Education Math Techbook™ for Grades 6-8

Submitted May 1, 2017

We are grateful for the thorough analysis of Math Techbook by EdReports. The review validates a four-year effort to produce high-quality instructional materials that meet or exceed the bar set by more than 20 years of research in mathematics education. Built to meet the recommendations in the *K-8 Publishers' Criteria for the Common Core State Standards for Mathematics*, Math Techbook reflects both the spirit and intent of the Common Core State Standards for Mathematics (CCSSM). Consequently, the design of Math Techbook presents material in a manner that allows all students to learn mathematics with an appropriate level of depth and rigor.

Discovery Education invites you to review Math Techbook. Please visit **www.tinyurl.com/MTBpreview** to learn more about Math Techbook and to register for a free 60-day trial.

Discovery Education Math Techbook received perfect scores for grades 6, 7, and 8 on the first two gateways: Focus & Coherence and Rigor & Mathematical Practices. In addition, Math Techbook received a perfect score on the first subcategory (Use and Design to Facilitate Student Learning) within the third gateway, Usability. The following responses address some of the indicators in the third gateway for which Math Techbook did not receive full credit.

Indicator 3m

Materials provide strategies for gathering information about students' prior knowledge within and across grade levels.

The EdReports evaluation states that there are no specific strategies for assessing students' prior knowledge. The Math Techbook approach to pre-assessment is to pique student interest while collecting data regarding their ability to handle the coming material. Each concept is designed to increase student interest through engaging activities while also assessing student readiness through interactives and technology-enhanced items (TEIs). Student results of these informal assessments are available for the teacher and student in the Dashboard. The design intentionally does not begin with a traditional pre-assessment; rather, it follows the best practices that view formative assessment as an ongoing process (Black and Wiliam, 1998; Stiggins and DuFour, 2004).

In the latest version of Math Techbook (Summer 2017), there are several additional opportunities to gather information about students' prior knowledge. The first page (Engage) within the Discover section contains two questions to activate and assess prior knowledge. These questions provide an opportunity to determine a student's readiness for the current concept. Coupled with the other activities on the Engage page and the Reach-Back Standards in the Model Lesson, this multi-pronged approach provides appropriate data to teachers to determine if students are ready for the material they are about to learn.

Indicator 3n
Materials provide strategies for teachers to identify and address common student errors and misconceptions.

As the EdReports review notes, a list of misconceptions is prominently displayed in the Model Lesson. The review claims that there are no strategies to identify and address misconceptions, but suggestions for how to address, and possibly correct, those misconceptions are included throughout the Model Lesson and in the Teacher Notes that appear when teacher presentation mode is turned off.

Indicator 3p.i
Assessments clearly denote which standards are being emphasized.

The EdReports analysis claims that assessment questions are not aligned to standards. Although not always revealed to the user, every item is linked to at least one math standard. Within the Practice section of each concept, all items are aligned to objectives, each of which is a subcategory of the standards. Because the CCSSM standards vary in depth and breadth of content, Discovery Education generated objectives based on the CCSSM of similar size for ease of instruction. All Coach and Play items in the Practice section are aligned to those objectives, which are viewable through the Dashboard. Similarly, all items on the unit assessments were developed in alignment with the standards to be assessed, and student performance results within the Dashboard are grouped by standard or concept.

The latest version of Math Techbook (Summer 2017) allows users to filter results by objective and identify areas of difficulty. The dashboard then provides suggested assets for remediation that could be assigned to struggling students.

Indicator 3p.ii
Assessments include aligned rubrics and scoring guidelines that provide sufficient guidance to teachers for interpreting student performance and suggestions for follow-up.

The EdReports analysis suggests that Math Techbook could provide additional information to teachers for follow-up. There are several areas where guidance is provided to teachers regarding student performance. For each open-ended problem in Math Techbook, a sample

student response suggests how a top-level student might respond; this is consistent with materials provided by the Smarter-Balanced Assessment Consortium (SBAC). In addition, the Model Lesson contains a description and possible uses for each Apply problem, which provides guidance to teachers.

Indicator 3s
Materials provide teachers with strategies for meeting the needs of a range of learners.

The EdReports analysis suggests that Math Techbook could do more to provide differentiation strategies for teachers. Math Techbook provides significant differentiation strategies, including recommendations for how to help struggling students, throughout the Model Lesson and Teacher Notes, the latter of which are available by turning off teacher presentation mode. As a digital service, Math Techbook was designed on the principles of Universal Design for Learning (UDL) and provides multiple ways for students to learn, whether through different language settings, speak-aloud text, the ability for teachers to easily assign different activities to students, engaging interactives, or video. Additionally, Math Techbook provides multiple ways for students to demonstrate their learning—through traditional assessments, TEIs, teacher-scored open-ended responses, and the ability to upload graphic representations, video, and audio files. That said, we will strongly consider how to further enhance this aspect of our product.

Indicator 3u
Materials suggest support, accommodations, and modifications for English Language Learners and other special populations that will support their regular and active participation in learning mathematics (e.g., modifying vocabulary words within word problems).

The analysis by EdReports states that parent letters included with each unit are available in Spanish. This statement, though accurate, overlooks a number of other accommodations provided within Math Techbook, including the ability to display both the Discover section and the glossary in Spanish. In addition, there are suggestions within the Teacher Notes and the Model Lessons on how to provide support to both low-achieving and high-performing students, and extensions within the Discover section can be for differentiation with advanced learners. The design of Math Techbook lends itself to providing opportunities for ELL students to learn vocabulary in a more robust way; repeatedly, examples and counterexamples are available for students, asking them to discuss their own definitions with classmates before comparing their definitions to those in the glossary. The interactive glossary includes Spanish definitions, animations, and videos to help support students' mastery of the terms. The animations and videos provide a nonlinguistic representation, which helps many students overcome language barriers. Presenting vocabulary in this manner leads to greater understanding and retention than simply providing the corresponding word from other languages.

Indicator 3v

Materials provide opportunities for advanced students to investigate mathematics content at greater depth.

Math Techbook was designed so that all students can deeply explore and develop an understanding of each concept. In addition to the carefully crafted investigations, extensions and several Apply problems are provided with each concept that teachers can use to extend learning. Because they are open-ended, Apply problems implicitly provide differentiation, as students can finish them within one class period or spend a week exploring the topic. In addition, opportunities to extend learning are presented throughout the Model Lesson and Teacher Notes (available throughout the service by turning off teacher presentation mode).

For example, in Grade 6, the Model Lesson for Unit 3, Concept 3.1, Session 1 suggests that teachers can extend an investigation about decimal multiplication and division "with independent work by answering the question, 'How much is a ton of money?'" Similarly, in Grade 7, the Model Lesson for Unit 2, Concept 1.1, Session 5, suggests that teachers can extend an investigation for advanced students, stating, "…this trick can be tried with infinitely many denominators. […] any fraction *a/p* with an even number of repeating digits, where *p* is a prime number, if you divide the repeating digits into halves and then add the two halves together, the result will always be a string of 9s. Students who need enrichment may enjoy exploring this phenomenon." And in Grade 8, in Unit 1, Concept 1.1, Session 6, teachers are encouraged to challenge students by having them solve a problem "with missing exponents or bases." Students are to work backwards to determine the missing pieces that will result in a specific value.

References:

Black, P., and Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, *80*(2), 139-148.

Stiggins, R. & DuFour, R. (2009). Maximizing the power of formative assessments. *Phi Delta Kappan*, *90*(9), 640-644.