



Big Ideas Math: Modeling Real Life ©2019 Grades 3-5 Publisher's Response to EdReports Review

Overview

Big Ideas Math: Modeling Real Life for grades K-8 is a high-quality, rigorous math program built on the most current and widely accepted educational research. The data-driven program is effective in ensuring positive student outcomes in mathematics. This newly released math series is building a highly successful user base across a broad range of demographics and school settings.

Gateway 1: Focus and Coherence

On this objective portion of the EdReports review, our high scores across the series reflect that *Big Ideas Math: Modeling Real Life* is a standards-aligned program that fully covers the required content, the major work focus, and the progressions for each grade level.

In Grade 4, the percent of lessons devoted to major work and the percent of days devoted to major work are at least 65%. Go [here](#) to learn more about program focus and coherence, and to view a spreadsheet that shows how the Grade 4 materials satisfy the 65% requirement using EdReports' specific criteria and evaluation mechanism.

Gateway 2: Rigor and Mathematical Practices

EdReports' review of this gateway is not consistent across grades, revealing that there is a level of subjectivity to evaluating heavily embedded practices and rigor elements. *Big Ideas Math's* single authorship provides a cohesive structure and scaffolding for rigor and mathematical practices across grade levels.

Rigor

A truly rigorous program offers a balance of the three aspects of rigor: conceptual understanding (discovering why), procedural fluency (learning how), and application (knowing when to apply).

Conceptual Understanding

In Gateway 2, the program was reviewed against a narrow expectation of how conceptual understanding should be developed in a curriculum. Big Ideas Learning highly values conceptual development, placing it at the forefront of every section with a discovery Explore and Grow.

In these Explore and Grows, students explore, question, explain, and persevere as they seek to answer questions that encourage concrete to abstract thought. The Explore and Grows provide rich opportunities for students to develop deep conceptual understanding of topics across a

grade level. Each Explore and Grow was thoughtfully written to get students thinking conceptually, and while on the surface they may appear quite simple, it is here that students often discover foundational concepts that are central to the learning target of the section.

Explore and Grow

Draw an area model that represents 15×18 . Then break apart your model into smaller rectangles.

What is the total area of your model? Explain how you found your answer.

MP Reasoning Compare with a partner. Do you get the same answer? Explain.

Grade 4 Use Area Models to Multiply Two-Digit Numbers: Students break apart a model to find the total area. They then reason about how breaking apart the model in a different way yields the same total area.

As concepts are solidified in the lesson, every section provides opportunities for students to independently demonstrate conceptual understanding, in the in-class Show and Grow and Apply and Grow: Practice exercises, and in the Homework & Practice exercises. Every in-class and homework set intentionally includes conceptual questions to reinforce the learning.

Name _____

Apply and Grow: Practice

Use the area model to find the product.

3. $13 \times 19 = \underline{\quad}$

	10	9	
10	$10 \times \underline{\quad}$	$10 \times \underline{\quad}$	
3	$3 \times \underline{\quad}$	$3 \times \underline{\quad}$	

4. $25 \times 39 = \underline{\quad}$

	30	9	
20	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$
5	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$

Draw an area model to find the product.

5. $11 \times 13 = \underline{\quad}$ 6. $23 \times 26 = \underline{\quad}$

Use the area model to find the product.

1. $12 \times 13 = \underline{\quad}$

	10	3	
10	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$
2	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$

$\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

2. $38 \times 24 = \underline{\quad}$

	20	8	
30	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$
8	$\underline{\quad} \times \underline{\quad}$	$\underline{\quad} \times \underline{\quad}$	← $\times \underline{\quad}$

$\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

Chapter 4 | Lesson 3 159

Grade 4 Use Area Models to Multiply Two-Digit Numbers: The in-class practice set includes conceptual exercises (#3 and #4) to gauge student understanding.

The homework for this same lesson includes similar exercises (#1 and #2) to reinforce students' conceptual understanding.

Procedural Fluency

Every Explore and Grow is followed by a lesson where students are presented with precise definitions, examples, and self-assessment opportunities. Here students begin to shift their conceptual understanding into procedural fluency.

Application

Big Ideas Math exposes students to real-life application examples within every lesson and then follows with additional application problems for in-class problem solving practice. The homework contains a variety of application problems to strengthen and deepen students' problem-solving skills.

Think and Grow: Modeling Real Life

Class	Students
1	24
2	23
3	25
4	20


Example There are 4 classes going on a field trip. The classes will use 3 buses. Can the teachers have an equal number of students on each bus?
Think: What do you know? What do you need to find? How will you solve?
Step 1: Add to find how many students are going on the field trip.
 $24 + 23 + 25 + 20 = \underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}}$ students are going on the field trip.
Step 2: Is the total number of students divisible by the number of buses?
Find the sum of the digits of 92. $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$
The sum of the digits $\underline{\hspace{1cm}}$ divisible by 3.
The teachers $\underline{\hspace{1cm}}$ have an equal number of students on each bus.

Show and Grow: I can think deeper!

17. A teacher is making a 5-page test with 28 vocabulary problems and 7 reading problems. Can the teacher put an equal number of problems on each page?

18. A relay race is 39 laps long. Each team member must bike the same number of laps. Could a team have 8, 6, or 3 members? Explain.

19. **DIG DEEPER!** You have 63 clay figures to display on 7 shelves. Not all of the shelves need to be used and each shelf can hold no more than 25 figures. Each shelf must have the same number of figures. What are all the ways you could arrange the figures?



270

In this Grade 4 example, students apply what they have learned to a real-life application. Immediately following are similar application problems for students to answer independently, including a Dig Deeper exercise where students solve to answer a bigger question.

List the factors of the number.

7. 25 8. 56 9. 75

10. 80 11. 93 12. 61


13. **Reasoning** Why does a number that has 9 as a factor also have 3 as a factor?

14. **DIG DEEPER!** The number below has 3 as a factor. What could the unknown digit be?
 $3 \underline{\hspace{1cm}} 5$

15. **Number Sense** Which numbers have 5 as a factor?
50 34 25 1,485 100 48

16. **Modeling Real Life** You and a partner are conducting a bottle flipping experiment. You have 3 bottles with different amounts of water in each. You need to flip each bottle 15 times. If you take turns, will you and your partner each get the same number of flips?

17. **Modeling Real Life** A florist has 55 flowers. She wants to put the same number of flowers in each vase without any left over. Should she put 2, 3, or 5 flowers in each vase? Explain.



Review & Refresh

Compare.

18. 7,914 7,912 19. 65,901 67,904 20. 839,275 839,275

272

The homework for this same lesson includes similar application exercises (#16 and #17) to reinforce students' problem-solving skills.

Exposing students to problem solving in class allows them to move with confidence to deeper problem solving in the homework. While some proficient or advanced learners may move to independent problem solving easily, emerging learners benefit from examples. In either case, our curriculum provides teachers with a versatile program to use with every student. See more about program rigor [here](#).

Mathematical Practices


The EdReports review of *Big Ideas Math* discounts explicit teaching instruction as a proven teaching strategy. EdReports' focus maximizes the effect of the materials on students' learning and minimizes the effect of the teacher; Big Ideas Learning believes the opposite.

We believe in the teacher's role in instructing, cultivating, and measuring the math practices within daily instruction. The teacher creates a productive and conducive environment in which students are supported in exploration and discussion with their peers. The teaching edition notes opportunities for teachers to encourage expert mathematical thinking in students during

group work or in-class discussions. Fostering that thinking in class encourages these mindsets in students as they work independently.

The authors thoughtfully considered how students can develop mathematical proficiency throughout the program. The student and teaching editions regularly identify and encourage the mathematical practices throughout the curriculum.

projects for a fair, and each grade make the same number of projects? Explain.



13. **Structure** Newton found $315 \div 6$. Explain how the steps would be different if he had used 50 as the first partial quotient?

$$\begin{array}{r} 6 \overline{)315} \\ \underline{-240} 6 \times 40 \\ 75 6 \times 10 \\ 15 6 \times 2 \\ 3 \\ \hline 52 \text{ R}3 \end{array}$$

So, $315 \div 6 = 52 \text{ R}3$.

Chapter 5 | Lesson 5 225

ELL Support
Read each story aloud as students follow along. Clarify unknown vocabulary and explain unfamiliar references. Allow students to work in pairs and provide time to complete each exercise. Ask the questions presented and have pairs write their answers on a whiteboard or piece of paper to hold up for your review.

Think and Grow: Modeling Real Life
This application allows students to continue to show their understanding of how to read a problem and use it to build a problem-solving plan for situations related to division.

- Preview:** "Who can explain to us what an e-reader is? Does anyone have information about e-readers that they would like to share?"
- Turn and talk:** "Read the example. Without giving details about actual numbers, what is this problem about?" Give students time to talk and then share.
- MPI Make Sense of Problems:** You want to hear the essence of the problem without details. Example: person is buying an e-reader using a coupon and some e-books. How many e-books can they buy? This is the big view of the problem that students need to understand before they look for the known information and so on.
- Letters are used throughout this example to represent answers to the sub-questions. Students may ask why use a letter when you could use words: *How much money is left?* instead of the letter e . We could use all of the words. "What is the advantage to using a single letter?"
- Make Reasonable Estimates:** "What would be a reasonable estimate for how much is left to buy e-books? What would be a reasonable estimate for how many e-books can be bought?" Ask students to explain how they determined their estimates.
- MPI Make Sense of Problems and Persevere in Solving Them:** "Complete Exercise 8 and compare your answers with your partner. If answers differ, compare the sections of your problem-solving plan. Where do you agree? disagree? Why? Is your answer reasonable?"

In this Grade 4 exercise (#13), students analyze the steps used to find a product. Exercises like this help students develop the ability to look for and make use of structure.

Laurie's Notes regularly encourage teachers to lead discussions with their students to reinforce the math practices. This page from the Grade 4 Teaching Edition encourages discussion of a word problem to help students make sense of problems and persevere in solving them.

To strengthen the connection between the textbook labels and the eight Standards for Mathematical Practice, we have placed a correlation document online at BigIdeasMath.com. It can also be found [here](#).

Gateway 3: Usability

Usability is one of the hallmarks of the program that, regretfully, was not even reviewed. Student learning is our highest goal and our student materials are widely known for being clear and understandable. Similarly, the teacher materials are known for their depth and usability. Every component of the versatile teacher package was specifically targeted to help teachers in a practical way as they plan, teach, and assess for student learning. See more about program usability [here](#).

Conclusion

Big Ideas Math: Modeling Real Life was developed from the latest research with students and teachers in mind. This rigorous program strives for positive math outcomes to prepare today's students for the jobs of tomorrow. We invite you to go [here](#) to explore the program further.

Big Ideas Learning acknowledges the perceived value of third-party reviews as one of the criteria educational leaders use in their evaluation process. We appreciate the reviewer comments and consider all feedback in future program development. Please send any EdReports evaluation inquiries regarding *Big Ideas Math* to BIMqueries@BigIdeasMath.com.