

Principles to Action: 8 Highly Effective Teaching Practices were a focus during the development of *Ready Classroom Mathematics* and are embedded throughout teacher support and instruction. Examples included illustrate where the 8 Effective Teaching Practices are embedded in the curriculum.

Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.

- Within the Lesson Overview pages of the *Teacher's Guide*, **Content Objectives** are explicitly stated for each lesson. They highlight the mathematical learning goals for the lesson, while the Language Objectives identify how students show their understanding of those goals.
- At the beginning of each lesson in the *Student Worktext*, the objective for the lesson is clearly stated under the lesson title. *Student Worktext* pages start with an introductory paragraph introducing the learning of the session.
- The learning targets are also identified for each lesson on the *Student Worktext* page.

Learning Target

- Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

SMP 1, 2, 3, 4, 5, 6, 7, 8

Lesson Objectives

Content Objectives

- Understand that a fraction is a whole divided into some number of equal parts.
- Understand and recognize the parts of a fraction.
- Understand that unit fractions are the building blocks of fractions in the same way that 1 is the building block of whole numbers.

Language Objectives

- Write the fraction shown by an area model.
- Shade an area model to represent a given unit fraction.
- Shade area models to represent a variety of fractions.
- Orally define and use the key mathematical terms *denominator*, *fraction*, *numerator*, and *unit fraction* when describing reasoning to a partner.

Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.

- *Ready Classroom Mathematics* lessons follow the Universal Design for Learning (UDL). It removes barriers for learners and provides multiple ways for representing information. Our lesson supports learning through multiple methods or opportunities for engagement, representation, action, and expression.
- The **Try It, Discuss It, Connect It Routine** provides students with multiple entry points. These analytical tasks have a high threshold and low ceiling and build on students' prior knowledge of mathematical concepts.
- Students discussing their learning of mathematics using word/phrases and sentences in a sociocultural context is at the center of the *Ready Classroom Mathematics*. Students are encouraged to use both receptive and productive language first in small groups and then in whole group.

DISCUSS IT

Ask your partner: Do you agree with me? Why or why not?

Tell your partner: At first, I thought...

PAIR/SHARE

What is another model you could have used to show how to break apart the number?

Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.

- *Ready Classroom Mathematics* creates an environment that makes ample use of multiple modes of communication and representations to help students advance understanding of mathematics. The visual representations support mathematical thinking for ELLs and other students with language related needs.
- The **Connect It** portion of our routine helps make connections and reflect on what you have learned.
- Through the **Connect It** questions, students connect concrete and representational approaches to more abstract understanding as they formalize their connections. **Apply It** our thinking to new problems.
- Students may use concrete, representational, or abstract strategies to solve the problems based on their level of understanding at this point in the lesson.

CONNECT IT Make connections and explain your thinking

- 1 Why is the area model divided into four sections?
- 2 How do the four steps in the multiplication using partial products in **Model It** relate to the four sections in the area model in **Picture It**?
- 3 What is the sum of the partial products and also the product of 16 and 28?
.....
- 4 Would the product change if 20 + 8 on the left side of the area model were changed to 10 + 10 + 8? Explain.
- 5 How could you estimate to check the reasonableness of your answer to 16×28 by multiplying with easier numbers?

You can use an area model to multiply two-digit numbers.

To solve this problem, multiply 16 by 28.

	10	+	6
20	20×10 $2 \text{ tens} \times 1 \text{ ten} = 2 \text{ hundreds}$ 200		20×6 $2 \text{ tens} \times 6 = 12 \text{ tens}$ 120
+			
8	8×10 $8 \times 1 \text{ ten} = 8 \text{ tens}$ 80		$8 \times 6 = 48$

$200 + 120 + 80 + 48 = ?$

You can also multiply two-digit numbers using partial products.

$$\begin{array}{r}
 16 \\
 \times 28 \\
 \hline
 48 \rightarrow 8 \text{ ones} \times 6 \text{ ones} \\
 80 \rightarrow 8 \text{ ones} \times 1 \text{ ten} \\
 120 \rightarrow 2 \text{ tens} \times 6 \text{ ones} \\
 + 200 \rightarrow 2 \text{ tens} \times 1 \text{ ten} \\
 \hline
 ?
 \end{array}$$

Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.

- *Ready Classroom Mathematics* helps build strong mathematical habits in students through discourse-based instruction. The Try–Discuss–Connect instructional routine supports teachers in facilitating meaningful mathematical discourse in a manageable way that engages all learners. Each of the Standards for Mathematical Practice are developed throughout this instructional routine.
- The Try–Discuss–Connect instructional routine supports teachers to effectively:
 - engage students in meaningful mathematical discourse.
 - facilitate discussion of multiple student strategies, allowing students to build confidence in their mathematical abilities, make connections between representations, and develop flexible thinking seamlessly integrate the mathematical practices and questions with the appropriate Depth of Knowledge (DOK) level.



Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.

- Throughout the *Teacher's Guide* questions are presented at point of use to help guide discourse, including Listen For. These questioning strategies help build strong mathematical habits in students through discourse-based instruction. The Try–Discuss–Connect instructional routine supports teachers in facilitating meaningful mathematical discourse in a manageable way that engages all learners. Each of the Standards for Mathematical Practice are developed throughout this instructional routine.
- In addition, the **Discourse Cards** and **Cubes** that come with *Ready Classroom Mathematics* provide additional support to help pose purposeful questions.



Discourse Cards
(English)



Discourse Cards
(Spanish)

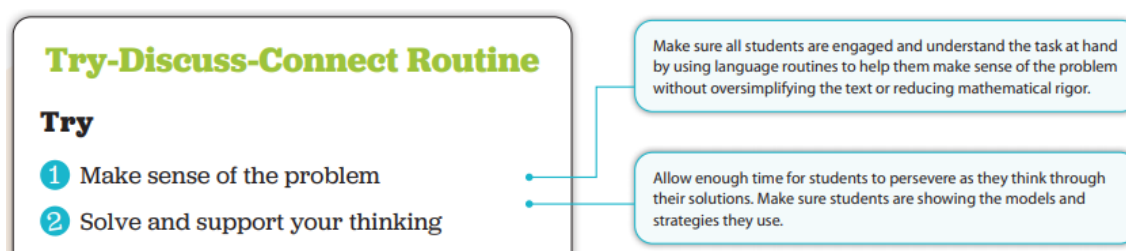
Build procedural fluency from conceptual understanding. Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.

- *Ready Classroom Mathematics* is designed so that students are practicing mathematics and building fluency not by learning and repeating procedures, but by reasoning strategically, solving problems, and discussing with peers.
- *Ready Classroom Mathematics* different lesson types—**Understand, Strategy, and Math in Action**—seamlessly balance the development of conceptual understanding, procedural skills and fluency, and application.
- From start to finish, students explore various strategies for solving problems as well as making computations, building greater flexibility and number sense for procedural tasks.
- *Ready Classroom Mathematics* integrates procedural skills and fluency within daily instruction as well as providing additional independent opportunities for development of procedural skills and fluency. See pages A30-A31 (Grades K and 3 pages A32–A33) in the *Teacher's Guide* for more information.
- Interactive Learning Games offer a multisensory approach to engaging students in fluency practice. They provide an interactive exploration of key skills in a low stakes setting, allowing students to develop a positive attitude toward challenge and perseverance.



Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.

- *Ready Classroom Mathematics* empowers all students to own their learning through a discourse-based instructional routine. Lessons are divided into Explore, Develop, and Refine sessions and are taught over the course 3–5 days. In Explore and Develop sessions teachers facilitate mathematical discourse through a Try–Discuss–Connect instructional routine. In addition, the Math in Action Lesson and Performance tasks at the end of each unit provide additional opportunities for students to engage in productive struggle.
- During the Try It portion of the routine students are given opportunities to make sense of the problem.



Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

- As students work through the routine teachers monitor their understanding and by purposely selecting and sequencing student work and having them share their thinking first in small group and then whole group.

