

Ready Classroom Mathematics Alignment to Alpine School District's Vision for Learning

Mathematical Practices Alignment

The lessons address Mathematical Practices for Students as stated in the State Core Curriculum in each grade level.

Mastery of the SMPs is vital for teaching students to recognize and be proficient in mathematics they will encounter in college and careers. The eight SMPs are built into *Ready Classroom Mathematics'* foundation—embedded in content instruction throughout the program. In alignment with the Utah Core Standards' emphasis, nearly every lesson in the *Student Worktext* encourages students to explain their reasoning, as well as attend to precision, make sense of problems, and persevere in solving them. The most relevant practice standards in each lesson are listed with the Content Standards on the Lesson Overview (the first page of each lesson) in the *Teacher's Guide*.

The image shows a page titled "Lesson Overview LESSON 13 Use Multiplication to Convert Measurements". The page is divided into several sections:

- CCSS Focus:** Domain: Measurement and Data; Cluster: A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit; Standard: 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; L, mL; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...
- Additional Standard:** 4.NBT.B.5 (See Standards Correlations at the end of the book for full text.)
- Standards for Mathematical Practice (SMP):** SMPs 1, 2, 3, 4, 5, and 6 are integrated in every lesson through the Try-Discuss-Connect routine. In addition, this lesson particularly emphasizes the following SMPs:
 - 4 Model with mathematics.
 - 5 Use appropriate tools strategically.
 - 7 Look for and make use of structure.
- Lesson Objectives:**
 - Content Objectives:**
 - Identify relative sizes of measurements within one system.
 - Identify the units of measurement within a measurement system.
 - Convert measurements from a larger unit to a smaller unit within the same system.
 - Use a conversion table showing equivalent measurements within the same system.
 - Multiply whole numbers of up to four digits by one-digit whole numbers.
 - Multiply a two-digit number by a two-digit number.
 - Language Objectives:**
 - List the units of measurement within a given system in order of size.
 - Draw diagrams to visually represent the relationship between units of measurement.
 - Describe the multiplicative relationship between different-sized units verbally or with equations.
 - Make tables to show equivalent measurements.
 - Use the term convert in discussions about equivalent measurements.
- Prerequisite Skills:**
 - Recognize the relationship between two factors in a multiplication equation as a multiplicative comparison.
 - Understand multiplication as repeated addition.
 - Understand that larger units can be subdivided into smaller units.
 - Understand that the same unit can be repeated to determine the measure.
 - Understand the relationship between the size of a unit and the number of units needed.
- Lesson Vocabulary:**
 - convert** to write an equivalent measurement using a different unit. Review the following key terms.
 - customary system** the measurement system commonly used in the United States that measures length in inches, feet, yards, and miles; liquid volume in cups, pints, quarts, and gallons; and weight in ounces and pounds.
 - metric system** the measurement system that measures length based on meters, liquid volume based on liters, and mass based on grams.
- Learning Progression:**
 - In previous grades** students worked with common measurement units and gained the understanding that the number of units needed to describe an object's length depends on the size of the unit used.
 - In this lesson** students express the relationship between two measurement units using multiplication. For example, an object's length in meters multiplied by 100 gives the length in centimeters.

267a Lesson 13 Use Multiplication to Convert Measurements ©Curriculum Associates, LLC. Copying is not permitted.

Figure 4. Example of a Lesson Overview, which lists Content Standards and relevant SMPs on the left.

Exhibits varied, rigorous, real world, and developmentally appropriate applications of Mathematical Practice skills.

The SMPs are embedded within the instructional design of *Ready Classroom Mathematics*. Through a dedicated focus on mathematical discourse, the program blends content and practice standards seamlessly into instruction, ensuring that students continually engage in developing the habits of the Mathematical Practices. Although all SMPs are included throughout instruction, practices receiving focused emphasis at different points during lessons are highlighted.

In addition to SMPs 1, 2, 3, 4, 5, and 6, which are integrated into the instructional routine, the *Teacher’s Guide* includes additional opportunities for students to develop the habits of mind described by the SMPs. The Table of Contents indicates all of the embedded SMPs for each lesson (both the integrated SMPs and the specific SMPs highlighted within the lesson), as shown in the figure below. The CCSS Focus in the Lesson Overview includes the SMPs addressed in each lesson. In the *Student Worktext*, the Learning Target also highlights the SMPs that are included in the lesson.

Standards for Mathematical Practice (SMP)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 1 Three-Digit Numbers	
Place Value, Addition, and Subtraction	
Unit Planning	
Learning Progression.....	1a
Connect Language Development to Mathematics	1c
ELL Language Expectations	1c
Professional Learning: <i>Supporting Math and Academic Vocabulary Development</i>	1d
Math Background	1e
Three-Digit Numbers	1e
Standards for Mathematical Practice in Every Lesson	1i
Unit 1 Themes	
Unit Opener	1
Build Your Vocabulary	2
Lesson 1 Use Place Value to Round Numbers.	3a
3.NBT.A.1	
Focus: A	SMP 1, 2, 3, 4, 5, 6, 7
Lesson 2 Add Three-Digit Numbers	25a
3.NBT.A.2, 3.NBT.A.1	
Focus: A	SMP 1, 2, 3, 4, 5, 6, 7, 8
Lesson 3 Subtract Three-Digit Numbers	47a
3.NBT.A.2, 3.NBT.A.1	
Focus: A	SMP 1, 2, 3, 4, 5, 6, 7, 8
Math in Action Using Rounding and Operations	76a
3.NBT.A.1, 3.NBT.A.2	
Focus: S/A	SMP 1, 2, 3, 4, 6, 7

Figure 5. As shown in this excerpt from a grade 3 *Teacher’s Guide*, the Table of Contents indicates all of the embedded SMPs for each lesson (both the integrated SMPs and the specific SMPs highlighted within the lesson).

The instructional materials identify and use the SMPs throughout, making it clear to both students and educators which SMPs are being addressed and how. SMP Tips on specific standards appear in the *Teacher’s Guide* for every lesson of every grade level. Almost every lesson of the *Student Worktext* encourages learners to explain their reasoning, attend to precision, make sense of problems, and persevere in solving them. Other SMPs are highlighted in the *Student Worktext* as appropriate to the content, with all SMPs being addressed multiple times.

Deepen Understanding: Features appear in the *Teacher's Guide* for every Strategy lesson. They highlight SMP connections to the lesson's mathematical concepts by offering questions and support for student conversation and understanding. Found at point-of-use, the Deepen Understanding does not reflect the only Mathematical Practice being addressed in the lesson, but rather one particular SMP that is highlighted at a given moment.

Discourse Questions: Throughout the *Teacher's Guide*, discourse questions appear with possible student responses to help support whole class discussion. **Ask/Listen** for suggestions appear in Explore and Develop sessions. The **Ask** questions may connect to an SMP when it is appropriate, or student responses may relate to an SMP. As students share their responses to these questions, they may make connections among different models and representations, critique approaches and solutions, or draw conclusions based on their observations.

Structure and Reasoning: Whether students are thinking about conceptual ideas, working on procedural processes, or applying their learning to real-world problems, they will have opportunities to find structure and construct reasoning throughout every lesson. As students make connections between multiple strategies, they may make use of structure (SMP 7) as they find patterns and use relationships to solve particular problems. Students may also use repeated reasoning (SMP 8) as they construct and explore general methods for procedural processes. SMPs 7 and 8 may be particularly emphasized in selected problems throughout the lesson. As students look for patterns and discover general methods, they always consider the reasonableness of their work.

SMPs Integrated in Try-Discuss-Connect Instructional Routine: *Ready Classroom Mathematics* infuses SMPs 1, 2, 3, 4, 5, and 6, into every lesson through the Try-Discuss-Connect instructional routine (found in the Explore and Develop sessions of Strategy lessons, with a modified routine used in Understand lessons). Also featured within the instructional routine, students may engage with SMPs 7 and 8 as they find patterns, use relationships, and construct general methods.

The first part of the Try-Discuss-Connect instructional routine is Try It, where students make sense of a problem and then use models or strategies of their choice to think through the problem. In Discuss It, students share their thinking with a partner, which teachers use to guide the whole-class discussion. Finally, in Connect It, students make connections among multiple strategies and reflect on their learning, before they apply their learning to new problems.

Try It begins with a version of the Three Reads routine:

- For the first read, students begin to make sense of the problem (SMP 1) as the teacher reads the problem aloud. Multiple students share a word or phrase that describes the context of the problem as the teacher guides them to attend to precision (SMP 6) of mathematical language and communication.
- For the second read, a student volunteer reads the problem aloud. Students focus on understanding what is being asked and how they can rephrase the question.
- For the third read, students read the problem in unison or in pairs. Students identify important information, make sense of the meanings of quantities, and discuss relationships between quantities in the problem, reasoning abstractly as they do this (SMP 2).

Try It continues as students work individually to represent and explain their thinking about the problem as they model important quantities and relationships (SMP 4) concretely, visually, or using other representations. Students have access to a variety of tools and manipulatives to represent the problem, and they make strategic decisions about which tool(s) might be appropriate (SMP 5).

Discuss It begins as student pairs explain and justify their strategies and solutions to each other. Partners listen to and respectfully critique each other's reasoning (SMP 3). To promote and support partner conversations, the teacher shares sentence starters and questions for discussion, and guides students to attend to greater precision (SMP 6) in their mathematics communication, language, and vocabulary. During this time, the teacher is listening in to peer conversations and reviewing student strategies, identifying which three or four strategies to discuss with the whole class in the next part of Discuss It.

Discuss It continues as students share their thinking with the class. The teacher facilitates this portion of the lesson by sequencing the strategies identified for whole class conversation during the partner discussion, as well as any strategies in the *Worktext* that students did not share. As students/pairs share their different approaches or review *Worktext* strategies, they reason abstractly and quantitatively (SMP 2) as the teacher prompts multiple students to understand the student explanations through restating and rephrasing (SMP 3). All students reason abstractly and quantitatively (SMP 2) as they find similarities, differences, and connections among the strategies they have discussed and relate them to the problem they are solving.

Connect It begins with students working independently or in pairs to further strengthen the connections between the strategies they discussed that are presented in the *Student Worktext*. As students think through these problems, they connect the quantitative, concrete/representational approaches to a more abstract understanding (SMP 2). Teachers guide students in a whole-class discussion of one or two problems, focusing on those that summarize critical concepts. Connect It continues as students apply what they have learned throughout the session to new problems. For each problem, students determine which strategies they feel are appropriate, and they model and solve (SMP 4) using pictures, diagrams, or mathematical representations. Students can also choose from a variety of mathematical tools and manipulatives (SMP 5) to support their understanding.

i-Ready Diagnostic & Instruction also embeds the SMPs, and students use the SMPs through the course of working through the *Diagnostic* assessments and online instruction. For example, *i-Ready Diagnostic* includes items that are phrased so that students must choose the best explanation or prove a point (construct viable arguments) about a math topic. SMP 5 (choosing tools strategically) is especially highlighted in the *Diagnostic* when students have various tools available to them and must choose an appropriate tool to help them with the problem.

Aligns with Alpine School District's Vision for Learning for Mathematics in developing Knowledge, Skills, and Dispositions.

As the Committee reviews *Ready Classroom Mathematics* and the included digital and print components for Teachers and Students, they will see the underlying philosophy and structure of the program is in complete alignment with the Alpine School District's Vision for Learning Mathematics. Beginning with the Table of Contents it is clear to see the focus on the major works and standards for each grade. Our multiple-day lesson structure was built to allow students ample time to build a strong conceptual understanding, become procedurally fluent, and finally to be able to independently apply their learning in a variety of real-world application problems.

The structure of the *Try–Discuss–Connect Routine* allows teachers to integrate the SMPs and National Council of Teachers of Mathematics (NCTM) Effective Mathematics Teaching Practices organically as part of their everyday lesson structure. As students engage in discourse—in small groups and whole-class—they are given repeated opportunities to explore new and various models and methods of solving problems in a collaborative environment that supports all learners and provides access points into the math for students ranging from below-level to those who are ready for enrichment.

Addresses and focuses teacher skills on the NCTM's 8 Effective Mathematics Teaching Practices.

The infographic is divided into three main sections. On the left, three green boxes represent the 'Try-Discuss-Connect' routine: 'TRY IT' with a pencil icon, 'DISCUSS IT' with speech bubble icons, and 'CONNECT IT' with a lightbulb icon. The 'Ready Classroom Mathematics' logo is at the bottom left. The middle section, titled 'Standards for Mathematical Practice' (Mathematically proficient students...), lists eight standards. The right section, titled 'NCTM Teaching Practices' (Effective mathematics educators...), lists eight practices. The SMPs are numbered 1-8, and the NCTM practices are numbered 1-8, showing a direct correspondence between the two.

Standards for Mathematical Practice <i>Mathematically proficient students...</i>	NCTM Teaching Practices <i>Effective mathematics educators...</i>
1. Make sense of problems and persevere in solving them.	1. Establish mathematical goals that focus learning
2. Reason abstractly and quantitatively	2. Implement tasks that promote reasoning and problem solving
3. Construct viable arguments and critique the reasoning of others	3. Use and connect mathematical representations
4. Model with mathematics	4. Facilitate meaningful mathematical discourse
5. Choose appropriate tools strategically	5. Pose purposeful questions
6. Attend to precision	6. Build procedural fluency from conceptual understanding
7. Look for and make use of structure	7. Support productive struggle in learning mathematics
8. Look for and express regularity in repeated reasoning	8. Elicit and use evidence of student thinking

(CCSS, 2010) *(NCTM, 2014)*

Figure 6. *Ready Classroom Mathematics*' "Try-Discuss-Connect" routine ensures that all teachers and students integrate the SMPs and NCTM Effective Mathematics Teaching Practices.

Uses and connects mathematical representations (diagrams, graphs, models, manipulatives) for understanding.

Yes. Mathematical modeling is taught throughout each of our programs, providing multiple representations to help students analyze, interpret, and build a deeper understanding of mathematical concepts.

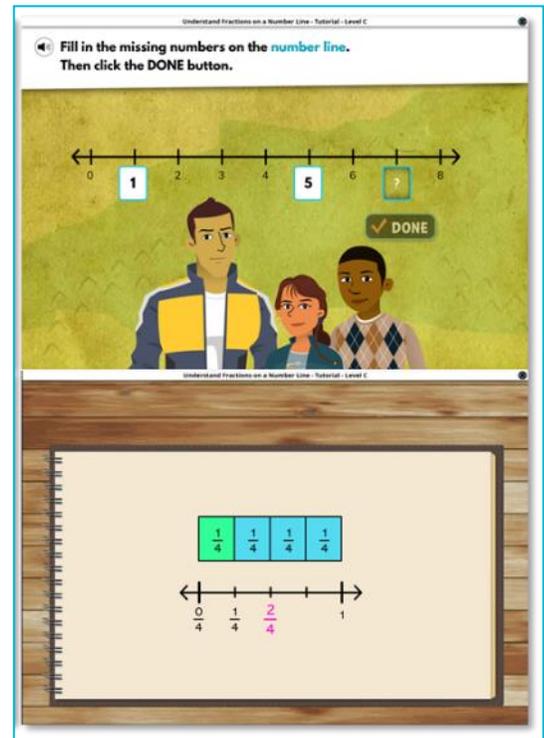
Ready Classroom Mathematics instructional design moves from concrete to representational to abstract (CRA Model). Therefore, within the program, cognitive development tools such as ten frames, number lines, area models, and fractions bars are used throughout the instructional routine. These tools are used to promote conceptual understanding and connect to previous learning. The tools provide opportunity for students to think deeply and encourage reasoning and making sense.

i-Ready Diagnostic & Instruction for Grades K-8

i-Ready also incorporates numerous interactive tools and virtual manipulatives to engage students in the lessons. (See the images to the right from an online grade 3 lesson, *Understanding Fractions on a Number Line*.)

i-Ready includes technology-enhanced items and lessons—such as numeric entry, matching tables, fill-in tables, drag and drop, graphing interaction, hot text, select text, reorder text, inline choice, number line, multimedia passages with animation, and virtual tools—to get to the core of each student's strengths and challenges and customize instruction to meet each student's needs.

To experience these mathematical representations firsthand, reviewers may log in to the *Teacher Toolbox* or *i-Ready* using sandbox accounts provided upon request.



More than one domain of understanding is addressed: conceptual, representational, and procedural understanding is present and connections between domains are made.

Aligning with the balance between understanding and procedure reflected in Utah Core Mathematics Standards, *Ready Classroom Mathematics* meets the rigor reflected in the standards through a balance of conceptual understanding, procedural skills, fluency, and application. Curriculum Associates specifically designed and developed the program based on the rigorous expectations of the college- and career- ready standards, to fully prepare students to master the standards, think like mathematicians, and find joy in learning.

Ready Classroom Mathematics' clear, thoughtful pedagogy and research-based model enrich the classroom with reasoning, discourse, and a range of mathematical practices to be used in real-world problem solving, supported by the Think-Share-Compare routine embedded in all lessons. This instructional routine also forms the foundation for the *Ready Classroom Mathematics'* Try-Discuss-Connect model, described in our original proposal. Problem solving facilitates deep conceptual understanding of key mathematical concepts, presenting multiple representations to make connections and illustrate the concept behind procedural fluency.

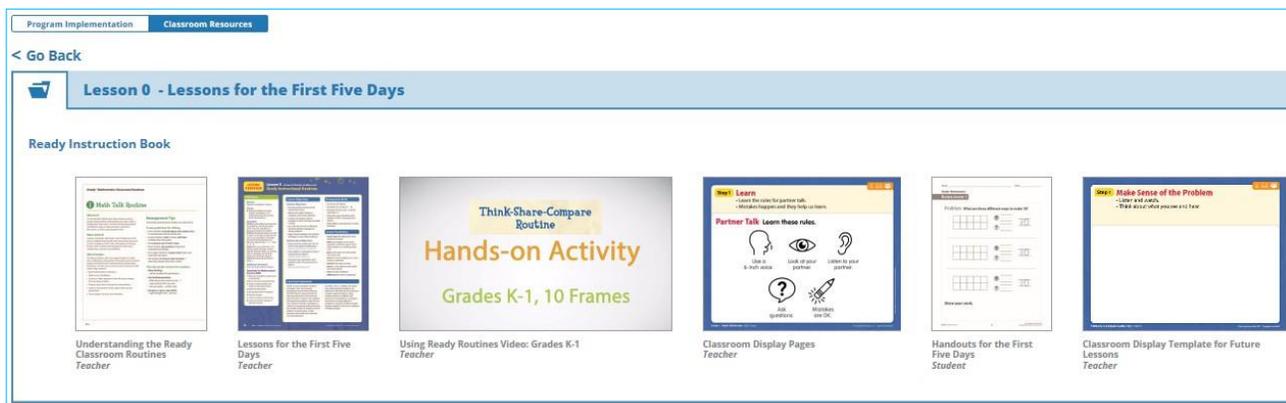


Figure 9. The Try-Discuss-Connect instructional routine is introduced in Lesson 0 in the online *Teacher Toolbox*. All available grade levels of *Ready Classroom Mathematics* resources are provided digitally to every teacher through the *Teacher Toolbox*.

There are numerous classroom discourse questions, critical-thinking questions, activities, and practice problems that provide ongoing development and assessment of student understanding. Lessons include questions with a range of depth of knowledge (DOK) levels and questions that address the SMPs, with a heavy emphasis on mathematical discourse.

Standards that explicitly call for understanding are addressed in *Ready* lessons with titles that begin with the word “Understand.” Throughout all lesson types, conceptual understanding is developed and problems and conceptual discussion questions are abundant in the *Student Worktext* and the *Teacher’s Guide*. This approach helps students make connections across mathematical representations.

All *Ready* materials are designed so that students attain the fluencies and procedural skills required by the standards. Computational fluency and fact fluency are both addressed throughout the *Ready* program. For example, in grade 3, students are expected to fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. Students also are expected to multiply and divide within 100 and understand properties of multiplication and the relationship between multiplication and division. The analysis by EdReports on grade 3 *Ready* materials confirm that the materials “give attention throughout the year to procedural skill and fluency.” The EdReports score was 18/18 for Rigor & Mathematical practices for all grades, K–5.

The image displays three green buttons at the top: "TRY IT" with a pencil icon, "DISCUSS IT" with a speech bubble icon, and "CONNECT IT" with a lightbulb icon. Below these are three pages of math worksheets. The first page is titled "Practice Using Grouping to Multiply" and includes an example of beads in bags and a multiplication problem. The second page has three numbered problems about grouping numbers. The third page is titled "Fluency and Skills Practice" and includes a table of multiplication problems and student answers.

Figure 10. With the Try-Discuss-Connect routine, students employ a variety of strategies and teachers select and sequence student work.

Supports the intentional development of students’ conceptual understanding and provide opportunities for students to develop procedural skills and fluencies.

Yes. Throughout our core math program, students engage in an appropriate balance of conceptual understanding, procedural skill, and fluency.

Ready Classroom Mathematics provides a balanced approach to teaching mathematics, with equal time and intensity on developing conceptual understanding, procedural fluency, and application. *Ready Classroom Mathematics* provides combinations of instructional activities that balance the aspects of rigor **across** and **within** lessons.

That balance is shown across lessons through our three different lesson types: **Understand Lessons**, **Strategy Lessons**, and **Math in Action Lessons**. In addition to the three types of lessons, the program includes numerous design components and resources within each lesson that reflect the aspects of rigor both individually and in combination with each other.

Below we highlight the components of the program that help students build conceptual understanding:

Understand lessons address standards specifying “Understand” and occur at key points in the instructional sequence. They focus on building conceptual understanding and help students connect new concepts to familiar ones. Students develop conceptual understanding in *every* lesson through Hands-On Activities referenced at point-of-use in the *Teacher’s Guide*.

- With the **Try-Discuss-Connect routine**, students employ a variety of strategies and teachers select and sequence student work. This provides an opportunity to connect Concrete-Representational-Abstract (CRA) thinking and encourage deeper understanding.
- The **Connect It** questions and **Reflect** questions in the Develop sessions of each lesson are designed to deepen all students’ conceptual understanding.
- Within the lesson, teachers are provided with **Ask/Listen for** prompts to monitor student understanding and prevent common misconceptions before they happen. As students share their thinking, the discourse questions can be used to make connections between student approaches and different models and representations, prompt justifications and critiques of approaches and solutions, and check conceptual understanding.

Support Whole Class Discussion

4 Tell students that this problem will prepare them to provide the explanation required in problem 5.

Be sure students understand that the problem is asking them to represent the same equation twice: once with words and once with fractions.

Ask What part of the problem do each of the fractions in the equations show?

Listen for $\frac{5}{6}$ is the amount of water in the bottle. After Alberto drinks $\frac{4}{6}$, there is $\frac{1}{6}$ left.

Ask What is the same about the two equations?

Listen for The numerators, 5 and 4, are numbers in each equation; the denominators are words in one equation and numbers in the other.

Figure 11. Sample Ask/Listen for prompts from the *Teacher’s Guide*, grade 4.

- **Deepen Understanding** in the *Teacher’s Guide* is a consistent opportunity to build conceptual understanding of key lesson concepts and to help avoid misconceptions before they happen. The content connects an aspect of lesson learning to a specific SMP, providing questions and teacher support for classroom connections and conversation.

Deepen Understanding
Use Place Value to Round
SMP 7 Look for structure.

To support discussion of problem 4, prompt students to consider why you can compare the number of hundreds in 117,290 to 5 hundreds to help you round.

Ask *How do you know which place value in 117,290 to compare to 5 hundreds?*

Listen for Since 2 is in the hundreds place, compare 2 hundreds to 5 hundreds.

Write “Since 2 hundreds < 5 hundreds, round ___.” [down] on the board and have students come up with the missing word.

Generalize *Why can you compare 2 hundreds to 5 hundreds to help you round? Have students explain their reasoning. Listen for understanding that 5 hundreds is halfway between 0 hundreds and 10 hundreds, so if the number you are rounding has less than 5 hundreds, round down.*

Figure 12. The sample Deepen Understanding above is from a grade 4 lesson on rounding whole numbers.

Ready Classroom Mathematics also has a strong focus on procedural fluency:

- Every session within a lesson begins with a **Start** question (provided on opening slides) that activates prior knowledge and reviews topics from earlier in the lesson or year, contributing to students’ procedural fluency.
- **Fluency standards** are afforded increased instructional time to ensure students have adequate time to attain fluencies and procedural skills.
- **Building Fluency** activities (grade K) provide ongoing fluency practice to support students in developing counting and quantity number sense through repeatable activities. They are used flexibly across a lesson.

Building Fluency

Practice one-to-one correspondence counting to 10.

During daily activities and routines have children count objects, pictures, themselves, and so on. You might also have children do action counting. While they are waiting in line or at circle time, tell them to *jump 5, clap 8, march 10*, etc.

Figure 13. Sample from the *Teacher’s Guide* for Kindergarten.

- **Fluency Practice** activities (grades K–1, *Teacher’s Guide*) provide fluency practice to support students in developing flexible thinking and facility with procedures and computational skills.

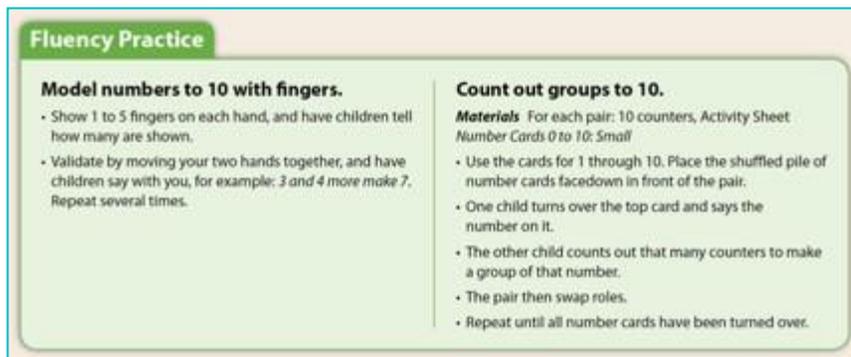


Figure 14. Sample from the *Teacher's Guide* for Kindergarten.

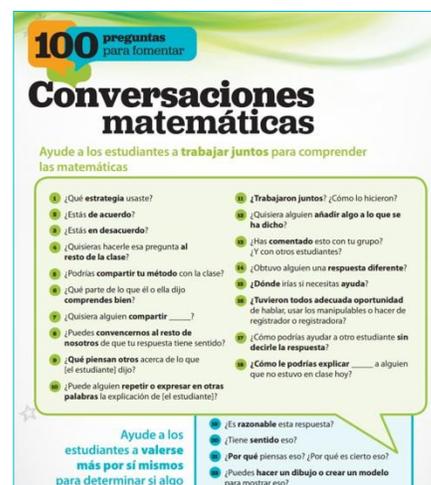
- Every lesson includes a **Refine** session that offers students opportunities to practice, refine, and strengthen concepts and skills with a varied series of questions (found in the *Student Worktext*) including contextualized problems.
- Every session includes **Additional Practice** to build procedural fluency.
- Referenced at the end of each lesson and found on the online *Teacher Toolbox*, **Fluency and Skills Practice** provides practice—including problems using repeated reasoning—to develop greater number sense and computational fluency.
- **Center Activities** provided on the online *Teacher Toolbox* provide peer activities and games that reinforce fluency.
- Interactive **Practice Tutorials** can be assigned to students as an engaging way to practice what they know to reinforce understanding.
- **Interactive Learning Games** engage students in fluency practice and can be accessed at any point in the lesson. They are an interactive exploration of key skills in a low-stakes setting, allowing students to develop a positive attitude toward challenge and perseverance.



Figure 15. Interactive Learning Games are available on the Student Bookshelf.

In addition to the specific math questions highlighted in the *Teacher’s Guide*, all teachers have access to “100 Questions that Promote Mathematical Discourse” at <https://www.curriculumassociates.com/products/ready-classroom-mathematics/math-discourse>. These questions, **available in English and Spanish**, help teachers guide classroom conversations so that students construct viable arguments and analyze the arguments of others by suggesting questions such as:

- Do you agree or disagree?
- What do others think about what [student] said?
- Can you explain how your answer is different from or the same as another answer?



Discourse Cards (which can be viewed on *Ready® Classroom Central*, <http://readyclassroomcentral.com/>) provide questions related to the SMPs and sentence starters that teachers can provide students to promote peer-to-peer conversations.

Throughout *Ready Classroom Mathematics*, problems and conceptual discussion questions are presented in the *Student Book* and the *Teacher’s Guide*. Additionally, problems and conceptual discussion questions help students make connections across mathematical representations. Students first work individually to represent their mathematical solutions in concrete, symbolic, or written form as they solve real-world problems. In the **Pair/Share** discussion, students explain their solution pathways to others and respond to clarifying questions. This encourages students to examine their premises and build logical arguments.

An additional resource, the online *Teacher Toolbox* offers hands-on activities and games, for practice opportunities for developing students’ conceptual understanding. *Ready Classroom Mathematics* materials are also designed so that students attain the fluencies and procedural skills required by the standards. Computational fluency and fact fluency are both addressed throughout the *Ready* program. In addition to procedural problems and exercises in the *Teacher Toolbox*, six to ten pages of practice, including procedural practice, provides numerous opportunities for fluency practice, including practice with repeated reasoning.

Divide Fractions—Repeated Reasoning Name: _____

Find patterns in fraction division.

Set A

1 $\frac{1}{2} \div \frac{1}{2} = \underline{\quad 1 \quad}$	2 $\frac{3}{2} \div \frac{1}{2} = \underline{\quad 3 \quad}$
3 $\frac{1}{2} \div \frac{1}{4} = \underline{\quad 2 \quad}$	4 $\frac{3}{2} \div \frac{1}{4} = \underline{\quad 6 \quad}$
5 $\frac{1}{2} \div \frac{1}{8} = \underline{\quad 4 \quad}$	6 $\frac{3}{2} \div \frac{1}{8} = \underline{\quad 12 \quad}$
7 $\frac{1}{2} \div \frac{1}{16} = \underline{\quad 8 \quad}$	8 $\frac{3}{2} \div \frac{1}{16} = \underline{\quad 24 \quad}$

Figure 16. The *Student Worktext* provides opportunities for fluency practice, including practice with repeated reasoning, as shown in this excerpt for grade 6.

i-Ready Diagnostic & Instruction for Grades K–8

i-Ready Instruction's digital lessons help target students' specific needs through their personalized instructional path. *I-Ready* will automatically identify skills students need to review, provide quick reinforcing lessons, and additional practice.

Problem-based learning tasks develop through student-driven conversations and team collaboration.

Yes. *Ready Classroom Mathematics* uses a problem-based approach to drive much of the learning, with age-appropriate modifications for students in younger grades. Almost all *Ready Classroom Mathematics* lessons require students to use SMPs 1, 2, 3, 4, and 6, with SMPs 5, 7 and 8 used as appropriate to the content. Thus, student progression through the lessons offers multiple opportunities for teachers to evaluate proficiency with the SMPs. Please see the numbered list in Section SMP 2 above, describing how all SMPs are covered in *Ready* lessons.

Various types of informal assessments are included throughout the *Ready* program. Numerous classroom discourse questions, critical-thinking questions, activities, and practice problems that provide ongoing assessment of student understanding. Questions cover the SMPs and a range of DOK levels, with a heavy emphasis on mathematical discourse.

Examples of opportunities to evaluate proficiency with SMPs include practice pages in the *Student Worktext*, fluency practice, rigorous questions such as Connect It and Talk About It questions, Pair/Share prompts within Guided Practice (grades 2–8), Quick Checks at the end of each lesson, and Step by Step and Mathematical Discourse sections in the *Teacher's Guide*.

Ready Classroom Mathematics provides many opportunities for speaking, reading, and writing to help students build effective communication skills and deepen mathematical learning. The **Try-Discuss-Connect routine** used throughout the program helps students develop speaking, reading, and writing skills. Students are expected to use critical thinking skills corresponding to the SMPs throughout the lesson. Each part of the routine highlights these expectations and practices:

- The **Try It** has students make sense of problems through multiple readings of the problem (three reads) and whole-class discussion.
- In **Discuss It**, students use listening and speaking skills in partner and whole class conversations and discover new strategies and approaches to mathematics problems.
- In **Connect It**, students are reading questions and responding to them with a combination of oral and written responses.
- **Pair/Share** questions are provided for each problem to support students in launching discussions about the problem and their solution strategies.

To further students' speaking and presenting skills, guidance in the *Teacher's Guide* supports both partner and whole group discussions through the **Discuss It prompt**. This prompt provides teachers with the questions to generate discussion, plus what to "listen for" when the students are responding. Students present their solutions and elaborate on important information.

DISCUSS IT

Support Partner Discussion
Encourage partners to connect the numbers in the related division and multiplication equations.
Support as needed with questions such as:

- *Did you find it easier to find the missing number in the division or the multiplication equation first?*
- *Why might you want to use a multiplication fact to help you solve a division equation?*

Support Whole Class Discussion
For each problem, have several students share their strategies for finding the missing numbers.

Ask *How many different strategies could you use to find the unknown number in a division problem?*

Listen for You can model with equal groups, an array, a division equation (and complete with a known fact), or a related multiplication equation.

Figure 17. Discuss It allows students to present their mathematical strategies and engage in whole-class discussion.

Reflect questions, at the end of each lesson session, also allow students to engage in mathematical discourse and present differing opinions. **Math Journal** questions are provided as another way for students to express their understanding of the concepts and strategies taught within the session in written response. **Math Talk at Home** conversation starters (provided in the *Teacher's Guide*) can be used to encourage students to write in their Family Letters or math journals and engage family members in further math conversation.

4 REFLECT
 Explain why it takes more $\frac{1}{8}$ s than $\frac{1}{4}$ s to make a fraction equivalent to $\frac{1}{2}$.

7 MATH JOURNAL
 Write a different word problem for the line plot from problem 6 that you can solve by adding or subtracting mixed numbers. Explain how to find the answer.

Math Talk at Home
 Encourage students to discuss with their family any foods they eat at home that can be separated into equal parts, such as pizza, pie, or another favorite food their family enjoys.

Conversation Starters Below are additional conversation starters students can write in their Family Letter or math journal to engage family members:

- Do you use a measuring cup when you cook? Can you show it to me so that I can see the markings?
- What favorite recipe can we make together?
- What do you eat that can be cut into parts?

Figure 18. Reflect questions, Math Journals, and Math at Home conversation starters are just some of the embedded practices designed to help students engage in mathematics through speaking, writing, and presenting.

The *Teacher's Guide* provides guidance for the teachers as they Select and Sequence their students work which provide a range of possible approaches from concrete to representational to abstract. This information can be used to make decisions about which models and strategies to share with the class.

LESSON 8 DEVELOP

Explore different ways to understand grouping factors in different ways.

Nycole decorates a pair of gloves with plastic jewels. She glues 3 jewels onto each finger, including thumbs. How many jewels does she use?

PICTURE IT
 You can use a picture to help you understand the problem.

There are 5 fingers with 3 jewels on each: $5 \times 3 = 15$.
 She has 15 jewels on each glove. There are 2 gloves.
 $15 \text{ jewels} \times 2$ finds how many jewels are on both gloves altogether.



You could also multiply another way. There are 2 gloves with 5 fingers each: $2 \times 5 = 10$. There are 10 fingers. There are 3 jewels on each finger: 10×3 also finds how many jewels she uses.

MODEL IT
 You can write a multiplication problem: $3 \times 5 \times 2$.

You can use parentheses to show which two numbers you will multiply first.

$(3 \times 5) \times 2 \rightarrow 15 \times 2 = 30$

You could also choose to multiply different numbers first.

$3 \times (5 \times 2) \rightarrow 3 \times 10 = 30$

194 Lesson 8 Use Order and Grouping to Multiply ©Curriculum Associates, LLC. Copying is not permitted.

Figure 19. An excerpt of a from *Ready Classroom Mathematics, grade 3, Student Worktext, Develop session.*