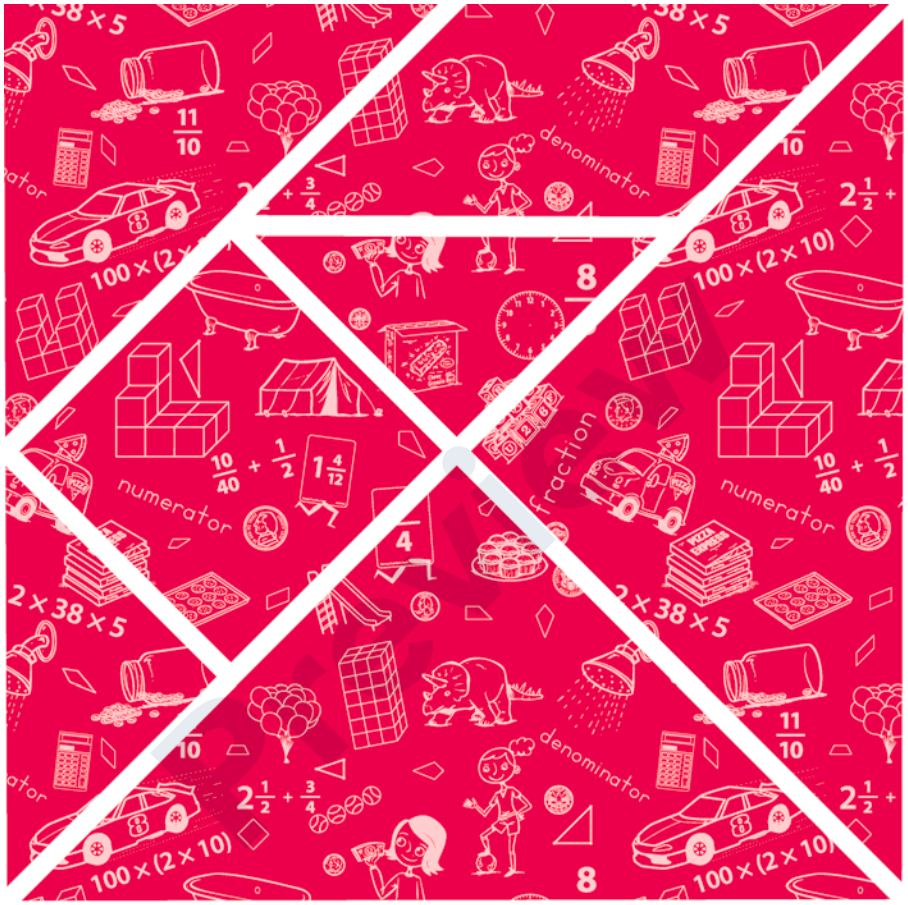
BRIDGES® IN MATHEMATICS



BRIDGES

ASSESSMENT GUIDE

GRADE 5

Published by The MATH LEARNING CENTER Salem, Oregon

Bridges in Mathematics Second Edition Grade 5 Assessment Guide

The Bridges in Mathematics Grade 5 package consists of:

- Bridges in Mathematics Grade 5 Teachers Guide Units 1–8
- Bridges in Mathematics Grade 5 Assessment Guide
- *Bridges in Mathematics Grade 5 Teacher Masters*
- Bridges in Mathematics Grade 5 Student Books Volumes 1 & 2
- Bridges in Mathematics Grade 5 Home Connections Volumes 1 & 2
- *Bridges in Mathematics Grade 5 Teacher Masters Answer Key*
- *Bridges in Mathematics Grade 5 Student Book Answer Key*
- *Bridges in Mathematics Grade 5 Home Connections Answer Key*
- Bridges in Mathematics Components & Manipulatives
- *Bridges Educator Site*
- Work Place Games & Activities
- Number Corner Grade 5 Teachers Guide Volumes 1–3
- *Number Corner Grade 5 Teacher Masters*
- Number Corner Grade 5 Student Book
- *Number Corner Grade 5 Teacher Masters Answer Key*
- *Number Corner Grade 5 Student Book Answer Key*
- Number Corner Components & Manipulatives
- Word Resource Cards

Digital resources noted in italics.

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Prepared for publication using Mac OS X and Adobe Creative Suite.
Printed in the United States of America.

QBB5801-9
Updated 2014-09-29.

Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at www.mathlearningcenter.org.

ISBN 978-1-60262-507-5

Grade 5

Bridges Assessment Guide

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Bridges Assessment Guide

Introduction

Although the role of assessment has become a complex and sometimes charged topic, the daily reality of assessment in the classroom remains both simple and profound. The fact of the matter is that assessment and good teaching go hand in hand. To teach effectively, we must be students of our students, continually observing, listening, and probing to determine how they are responding to our instruction. We can't teach well unless we know what our students already know, are in the process of learning, and need to know. Moreover, our students can't learn as effectively as they might unless they understand the short-term and long-term goals of instruction and have as much of a stake in their own learning as we do.

Assessment should be more than merely a test at the end of instruction to see how students perform under special conditions; rather it should be an integral part of instruction that informs and guides teachers as they make instructional decisions.

» NCTM

As a student-centered curriculum solidly rooted in problem solving, *Bridges in Mathematics* is filled with assessment opportunities. Consider the fact that many, if not most, of the sessions open with a question or prompt: a chart, a visual display, a problem, or perhaps a conjecture shared the previous day. Students are asked to share comments and observations, first in pairs and then as a whole class. This gives the teacher an opportunity to take the group's measure and conduct the day's instruction with a feel for the students in the room. While the strategy may be subtle, it reflects a radically different approach to instruction—one in which assessment takes the lead.

The *Bridges in Mathematics* curriculum features a variety of informal and formal assessments woven throughout the Bridges units and Number Corner workouts. These range all the way from tips to help teachers elicit student thinking to comprehensive written assessments at the beginning and end of each unit. The assessments themselves, along with all the needed materials, teacher masters, and instructions, reside in the Bridges and Number Corner Teachers Guides. The material in this Bridges Assessment Guide—answer keys, scoring guides, intervention and support suggestions, and tips for engaging students and their families in goal setting and progress monitoring—provides the tools teachers need to process and use the results of the assessments to guide instructional decisions.

There is a sidebar on this page (Production can put it in place) and a graphic (same).

Assessment Overview

Section 1: Standards & Assessments

Summarizes the Common Core State standards for fifth grade, provides a description of the types of assessments in Bridges and Number Corner, and features a complete list of all the assessments offered in Bridges Grade 5.

Section 2: Assessing Math Content

Takes a deeper look at the types of assessment tasks offered in Bridges Grade 5. Offers an assessment map that shows exactly where and when each Grade 5 Common Core standard is assessed and targeted for mastery.

Section 3: Assessing Math Practices

Profiles the CCSS Mathematical Practices in terms of fifth grade behaviors, and offers suggestions for assessing the practices through the year.

Section 4: Assessment as a Learning Opportunity

Describes ways in which the teacher can involve students in taking ownership of their own learning and monitoring their own progress toward mastering targeted skills, concepts, behaviors, and attitudes.

Section 5: Using the Results of Assessment to Inform Differentiation & Intervention

Details the connection between Bridges and Response to Intervention (RtI), and explains the scoring guides provided in the Bridges Unit Assessments and Number Corner Assessments parts of this guide.

Section 6: Reporting to Families

Suggests ways in which to help families understand the instructional targets for the year and monitor their child's growth and progress toward meeting those targets. Includes a Grade 5 Math Progress Report that might be used or adapted for use with other district reporting tools.

Bridges Unit Assessments

Features an assessment collection for each Bridges unit. Each collection includes:

- A brief description of all the assessments in the unit and the skills addressed
- Sheets for collecting observations about students' math skills and practices
- Answer keys and scoring guides for each assessment
- Suggestions for support and intervention

Number Corner Assessments

Features an assessment collection for Number Corner Grade 5. This collection includes:

- A brief description of the baseline and quarterly checkups
- A list of the skills addressed by each of the five assessments
- Answer keys and scoring guides for each assessment
- Suggestions for support and intervention

Comprehensive Growth Assessment

Describes the Comprehensive Growth Assessment (CGA), an instrument that provides global coverage of all the CCSS requirements for grade 5. It includes:

- A copy of the CGA, along with tips about how to use it to best advantage
- A list of materials needed to conduct the assessment, and all needed teacher masters
- A list of the skills addressed by each item on the assessment
- An answer key and scoring guide
- Suggestions for support and intervention

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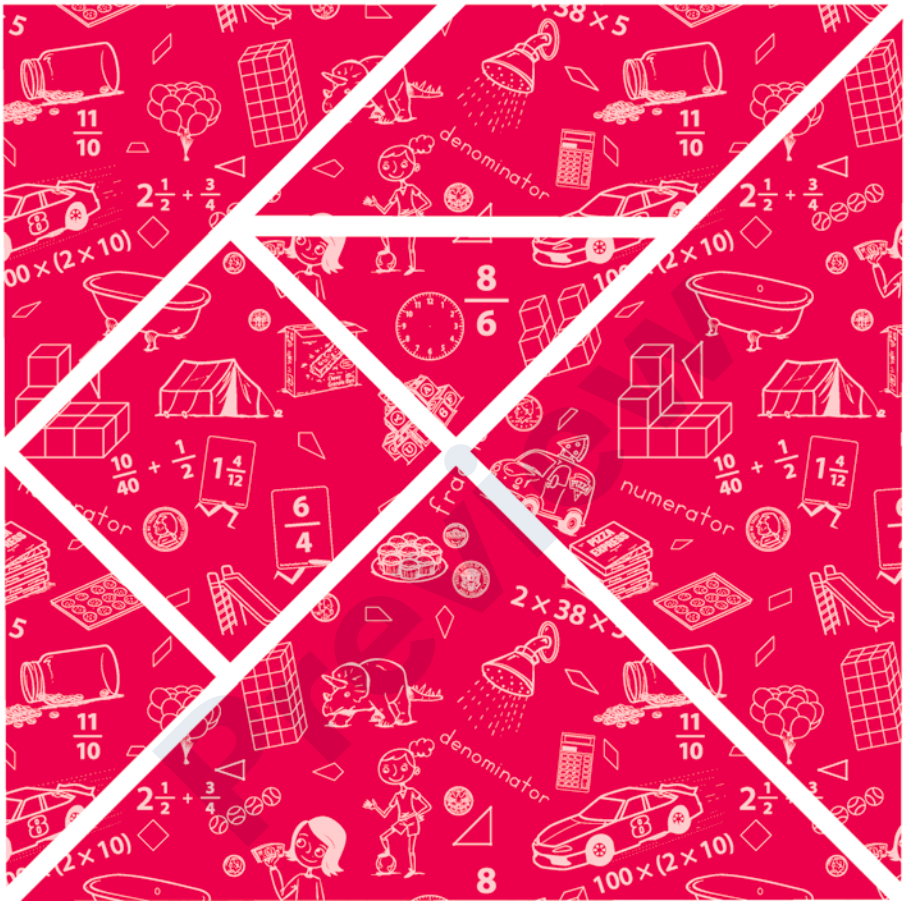

BRIDGES

ASSESSMENT GUIDE

GRADE 5

Assessment Overview

Published by The MATH LEARNING CENTER Salem, Oregon

Section 1

Standards & Assessments

Types of Assessments in Bridges and Number Corner

We have many ways of finding out what our students know. We can observe them as they work in a variety of settings—whole group discussions and math forums, problem-solving sessions, Work Places. We can converse with students informally as they solve problems or play games, and carefully examine samples of their work from time to time. We can assess students' conceptual understanding and procedural fluency at the beginning of each unit to help guide our overall approach, and find out who is likely to need extra support or additional challenge. Furthermore, we can share the results of these pre-assessments with students so they can set their own learning goals. We can conduct assessments during the unit to see how students are responding to our instruction, and again at the end of the unit to check for levels of mastery appropriate to the time of year. Finally, every two or three months we can have students complete sets of written tasks that cover a range of skills and concepts to look at long-term growth.

You've got to be very careful if you don't know where you are going, because you might not get there.

» Yogi Berra

To help teachers determine what their students already know, are in the process of learning, and need to know, Bridges and Number Corner feature several different types of assessments. Here is a brief description of each, and an indication of where it is found in the program.

Informal Observation

Located throughout Bridges Sessions and Number Corner Workouts

Informal observation is one of the best but perhaps most undervalued methods of assessing students. Teachers develop intuitive understandings of students through careful observation, but not the sort where they carry a clipboard and sticky notes. These understandings develop over a period of months and involve many layers of relaxed attention and interaction. Experience with the age-level helps—after several years at fifth grade, a teacher begins to notice patterns of behavior, things that 10- and 11-year-olds seem to say, think, or do on a fairly consistent basis. Knowledge of learning outcomes is essential—the better you know where you're headed, the easier it is to recognize skills and concepts as they emerge in students.

Bridges sessions and Number Corner workouts, which continually ask students to share and explain their thinking, present ongoing opportunities to gauge children's skill levels and conceptual understandings. As we become accustomed to learning from our students, we become increasingly skilled at spotting their strengths and needs, as well as using our observations to monitor and adjust our instruction accordingly. Throughout Bridges sessions and Number Corner workouts, teachers will find suggested questions and prompts to elicit student thinking, conversation, sharing, and explanation, as well as sample dialogs to help them anticipate students' responses. To make the CCSS Mathematical Practices easy to spot, Teachers Guide sidebars feature Math Practices in Action, which highlight and describe selected instances in which the practices are integrated into instruction.

Carefully observing students during whole-group instruction, as well as during Work Places when they are operating more independently, yields information about their math practices as well as math content skills. You will find more information about assessing mathematical practices in Section 3.

Structured Observation: Work Place Guides

Located in Bridges Units

Work Places—individual and small group games and activities—offer opportunities to observe and interact with students in authentic settings. To help teachers make the most of opportunities to assess students and provide on-the-spot support and challenge, each Work Place is accompanied by a guide that lists the skills and concepts involved, the materials needed, and a set of Assessment & Differentiation suggestions. This example is from Unit 2.

Unit 2 Module 2 | **Session 2** *1 copy stored for use by the teacher and other adult helpers during Work Place time*

Work Place Guide 2B Racing Fractions

Summary

Racing Fractions is played on a game board with eight fraction number lines showing halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths from 0 to 2. Players take turns selecting a fraction card and then moving one or more game markers the total distance shown on the card. The object of the game is to move all game markers to 2.

Skills & Concepts

- Recognize equivalent fractions (4.NF.1)
- Explain addition of fractions as joining parts referring to the same whole (4.NF.3a)
- Express a fraction as the sum of other fractions with the same denominator in more than one way (4.NF.3b)
- Add and subtract fractions with like denominators (supports 4.NF)
- Add and subtract fractions with unlike denominators, including mixed numbers (5.NF.1)

Materials

Copies	Kit Materials	Classroom Materials
TM T2 Work Place Guide 2B Racing Fractions **TM T3** 2B Racing Fractions Record Sheet **TM T4–T5** 2B Racing Fractions Game Board **SB 41** Work Place Instructions 2B Racing Fractions	• 8 red and 8 blue game markers, half-class set • Racing Fraction Cards, 4 decks	• tape • 4 zip-top sandwich bags

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that …	Differentiate	Example
One or more students are unsure of their moves.	SUPPORT Discuss students' reasoning with them. Make a sample move and discuss your own reasoning.	
A student always tries to move only one game marker exactly the value of the fraction card.	SUPPORT Ask the student to generate several possible moves for each card selected. Then, ask the student which possibility is the best move.	"You have the $\frac{5}{8}$ card. What are some different ways you could move $\frac{5}{8}$? What fractions add up to $\frac{5}{8}$?"
Students are readily making correct moves for any card.	CHALLENGE Ask students generalization and extension questions like those to the right.	"Which cards are most helpful to get at the beginning of the game? At the end of the game?" "For any given denominator, should you move the markers for fractions with larger or smaller denominators first?" "How could you race across the tracks with as few moves as possible?" "When would you want to move a game marker backward? Why?"
Students understand the game and are developing strategies for playing.	CHALLENGE After a few turns, ask students to think about which cards would or would not work for this point in the game. Challenge students to communicate their reasoning clearly.	

English-Language Learners Use the following adaptations to support the ELL students in your classroom.

- Post Word Resource Cards for important vocabulary such as *equivalent fractions*, *numerator,* and *denominator.*
- Pair ELL students strategically with students who will be supportive partners and can help explain the game. Or, pair ELL students with other ELL students who speak the same language and allow them to use their language as well as English.
- Play a demonstration game. Emphasize the different possibilities for each fraction card selected and the importance of developing strategies.

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Work Samples

Located in Bridges (Units 1, 2, 3, 4, 7, and 8)

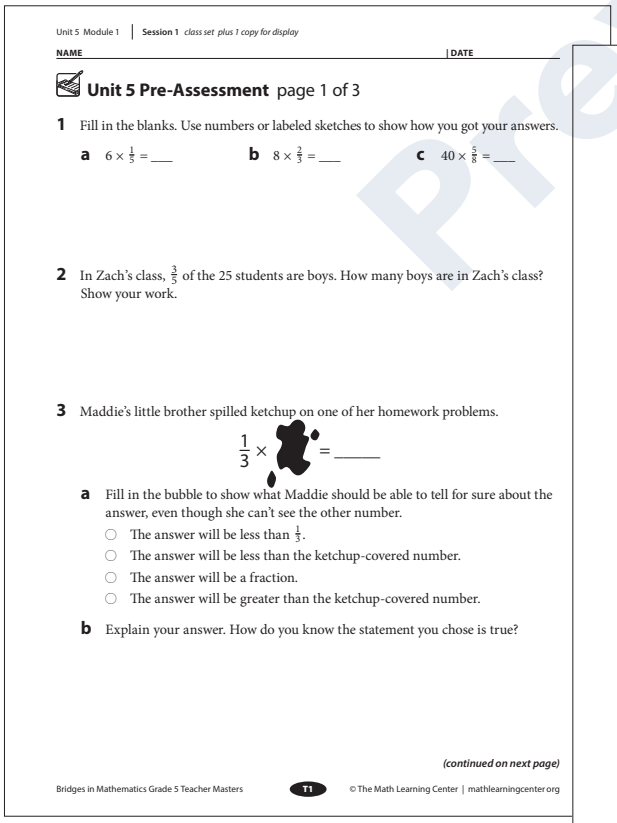
Another informal method of assessment is work samples, assignments completed by students in the course of normal instruction that you collect, examine carefully, and keep in individual portfolios. Saved over the year, a collection of work samples can contribute to your picture of each student's growth. Opportunities to collect work samples appear in Units 1, 2, 3, 4, 7, and 8, and you might decide to collect such samples from other units on your own after you're more familiar with the program. Although the work samples address different skills and concepts from one unit to the next, they share in common the requirement that students show their work and explain their thinking, using numbers, labeled sketches, or words.

Unit Assessments

Located in Bridges (Unit Pre-Assessments, Checkpoints, and Post-Assessments)

Bridges Units 1–7 include four to six assessments each—a pre-assessment at the beginning of the first module, one to three checkpoints or work samples during the unit, and a post-assessment at the end of the unit (see examples from Unit 3 below). Unit 8, an integrated math/science unit, has no formal assessments, but includes several suggestions for collecting samples of student work. The pre-assessments help teachers gauge students' conceptual understanding and procedural fluency at the start of each unit, making it easier to determine those students most likely to need extra support or challenge. Checkpoints and work samples allow teachers to see how students are doing with grade level standards at key points during the unit, so they can modify instruction if necessary. The unit post-assessments are similar to the pre-assessments, though generally a little more challenging. They are, however, similar enough to allow teachers to ascertain students' growth over each 4- to 6-week period of instruction.

This is the first page of the pre-assessment and post-assessment for Unit 5. Notice that the items on each sheet are very similar, but pitched at a somewhat higher level on the post-assessment.



Unit 5 Module 1 | **Session 1** *class set plus 1 copy for display*

NAME | DATE

Unit 5 Pre-Assessment page 1 of 3

1 Fill in the blanks. Use numbers or labeled sketches to show how you got your answers.

a $6 \times \frac{1}{5} =$ ___ **b** $8 \times \frac{2}{3} =$ ___ **c** $40 \times \frac{5}{8} =$ ___

2 In Zach's class, $\frac{3}{5}$ of the 25 students are boys. How many boys are in Zach's class? Show your work.

3 Maddie's little brother spilled ketchup on one of her homework problems.

$\frac{1}{3} \times$ [illegible] = _____

a Fill in the bubble to show what Maddie should be able to tell for sure about the answer, even though she can't see the other number.

- ○ The answer will be less than $\frac{1}{3}$.
- ○ The answer will be less than the ketchup-covered number.
- ○ The answer will be a fraction.
- ○ The answer will be greater than the ketchup-covered number.

b Explain your answer. How do you know the statement you chose is true?

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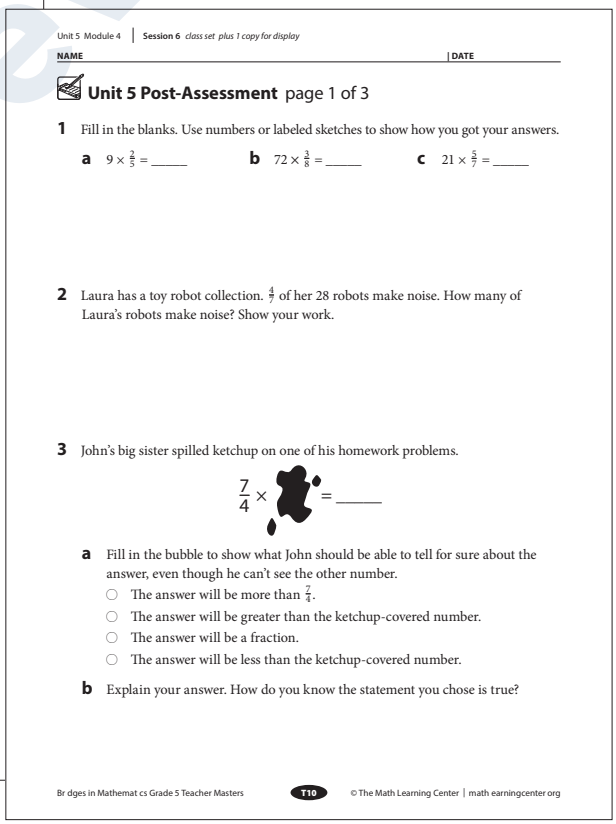

Unit 5 Module 4 | **Session 6** *class set plus 1 copy for display*

NAME | DATE

Unit 5 Post-Assessment page 1 of 3

1 Fill in the blanks. Use numbers or labeled sketches to show how you got your answers.

a $9 \times \frac{2}{5} =$ _____ **b** $72 \times \frac{3}{8} =$ _____ **c** $21 \times \frac{5}{7} =$ _____

2 Laura has a toy robot collection. $\frac{4}{7}$ of her 28 robots make noise. How many of Laura's robots make noise? Show your work.

3 John's big sister spilled ketchup on one of his homework problems.

$\frac{7}{4} \times$ [illegible] = _____

a Fill in the bubble to show what John should be able to tell for sure about the answer, even though he can't see the other number.

- ○ The answer will be more than $\frac{7}{4}$.
- ○ The answer will be greater than the ketchup-covered number.
- ○ The answer will be a fraction.
- ○ The answer will be less than the ketchup-covered number.

b Explain your answer. How do you know the statement you chose is true?

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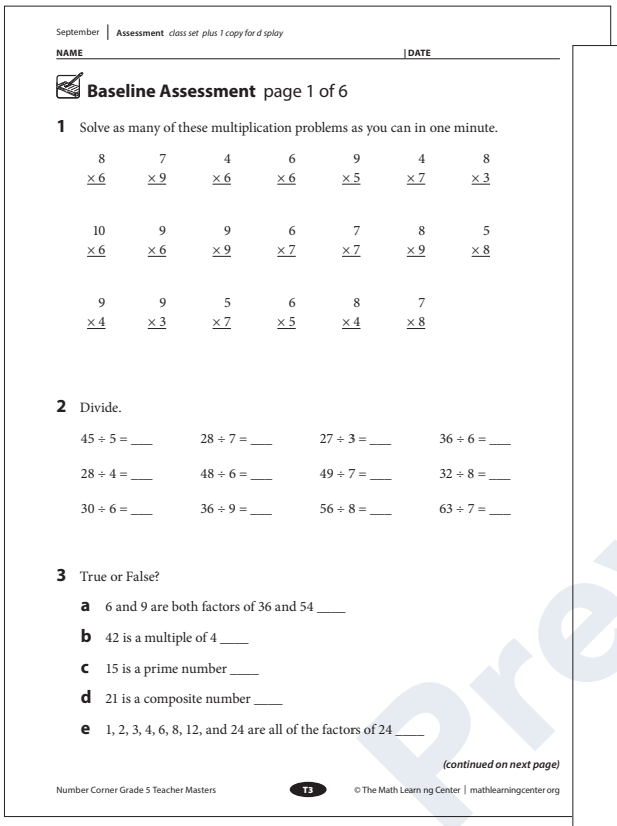
Long-Range Assessments

Located in the Number Corner (Baseline and Checkups)

The Number Corner Teachers Guide, September, offers a baseline assessment intended to gauge incoming students' proficiency with key number skills and concepts that were targeted for mastery by the end of fourth grade. In addition, the Teachers Guide includes four Number Corner Checkups to be administered at two- or three-month intervals. These periodic assessments, which reflect the major clusters associated with critical areas of focus, are designed to check for conceptual understanding, procedural fluency and application of coherent and rigorous standards. They also provide a snapshot of each student's skills near the end of each quarter of the school year.



September | **Assessment** *class set plus 1 copy for d splay*

NAME | **DATE**

Baseline Assessment page 1 of 6

1 Solve as many of these multiplication problems as you can in one minute.

8 × 6	7 × 9	4 × 6	6 × 6	9 × 5	4 × 7	8 × 3
10 × 6	9 × 6	9 × 9	6 × 7	7 × 7	8 × 9	5 × 8
9 × 4	9 × 3	5 × 7	6 × 5	8 × 4	7 × 8	

2 Divide.

45 ÷ 5 = ___	28 ÷ 7 = ___	27 ÷ 3 = ___	36 ÷ 6 = ___
28 ÷ 4 = ___	48 ÷ 6 = ___	49 ÷ 7 = ___	32 ÷ 8 = ___
30 ÷ 6 = ___	36 ÷ 9 = ___	56 ÷ 8 = ___	63 ÷ 7 = ___

3 True or False?

a 6 and 9 are both factors of 36 and 54 ____

b 42 is a multiple of 4 ____

c 15 is a prime number ____

d 21 is a composite number ____

e 1, 2, 3, 4, 6, 8, 12, and 24 are all of the factors of 24 ____

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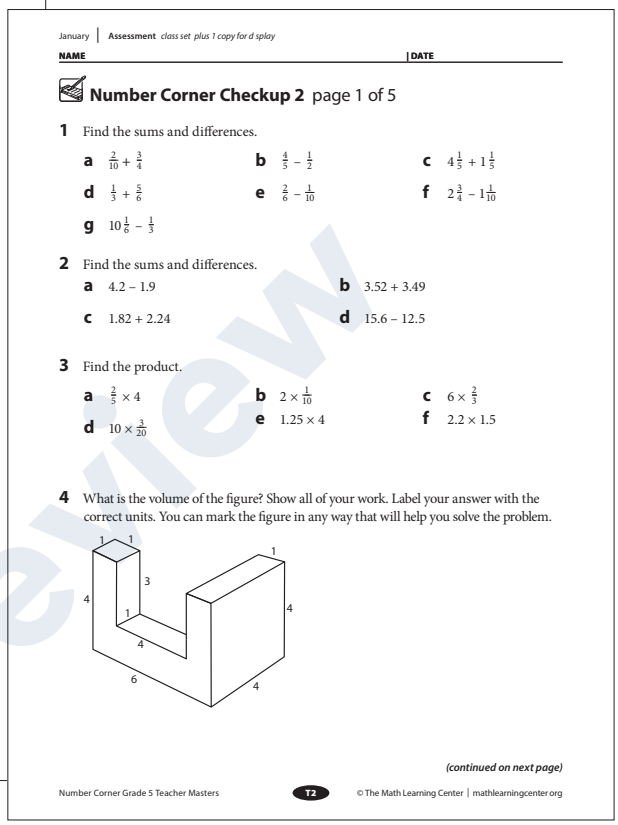

January | **Assessment** *class set plus 1 copy for d splay*

NAME | **DATE**

Number Corner Checkup 2 page 1 of 5

1 Find the sums and differences.

a $\frac{2}{10} + \frac{3}{4}$ **b** $\frac{4}{5} - \frac{1}{2}$ **c** $4\frac{1}{5} + 1\frac{1}{5}$

d $\frac{1}{3} + \frac{5}{6}$ **e** $\frac{2}{6} - \frac{1}{10}$ **f** $2\frac{3}{4} - 1\frac{1}{10}$

g $10\frac{1}{6} - \frac{1}{3}$

2 Find the sums and differences.

a 4.2 – 1.9 **b** 3.52 + 3.49

c 1.82 + 2.24 **d** 15.6 – 12.5

3 Find the product.

a $\frac{2}{5} \times 4$ **b** $2 \times \frac{1}{10}$ **c** $6 \times \frac{2}{3}$

d $10 \times \frac{3}{20}$ **e** 1.25×4 **f** 2.2×1.5

4 What is the volume of the figure? Show all of your work. Label your answer with the correct units. You can mark the figure in any way that will help you solve the problem.

(continued on next page)

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A Year's Worth of Assessments

Each assessment written into Bridges and Number Corner offers a window into individual students' skills and concepts at a particular moment in time. Any one of these assessments also gives you a snapshot of your entire class—you can literally see the spread of strategies and skills by sorting through the sheets or entering the information on the Class Checklist/Scoring Guide provided for each assessment in this guide. As you collect impressions, observations, and responses to written tasks, patterns of growth and development begin to emerge for the whole class and for each individual student, allowing you to make more nuanced and responsive instructional decisions.

The chart below shows all the assessments offered in Bridges and Number Corner Grade 5, in order of appearance during the year. The listing for each assessment includes its title, assessment type, and location in the program.

	Assessment Title	**Assessment Type**	**Location**
September	Work Place Guides for Work Places 1A, 1B, 1C, 1D	Observation	**Bridges** Unit 1
	Unit 1 Pre-Assessment	Pre-Assessment	**Bridges** Unit 1, Module 1, Session 3
	Numerical Expressions Checkpoint	Mid-Unit Checkup	**Bridges** Unit 1, Module 2, Session 1
	Boxes Work Sample	Work Sample	**Bridges** Unit 1, Module 2, Session 5
	Multiplication & Volume Checkpoint	Mid-Unit Checkup	**Bridges** Unit 1, Module 3, Session 2
	Unit 1 Post-Assessment	Post-Assessment	**Bridges** Unit 1, Module 4, Session 5
	Baseline Assessment	Assessment of Incoming Skills	**Number Corner** September
October	Work Place Guides for Work Places 2A, 2B, 2C	Observation	**Bridges** Unit 2
	Unit 2 Pre-Assessment	Pre-Assessment	**Bridges** Unit 2, Module 1, Session 2
	Fractions Work Sample	Work Sample	**Bridges** Unit 2, Module 1, Session 5
	Fraction Addition & Subtraction Checkpoint	Mid-Unit Checkup	**Bridges** Unit 2, Module 2, Session 6
	Working with Fractions Checkpoint	Mid-Unit Checkup	**Bridges** Unit 2, Module 3, Session 3
	Unit 2 Post-Assessment	Post-Assessment	**Bridges** Unit 2, Module 3, Session 6
	Number Corner Checkup 1	Quarterly Assessment of Skills	**Number Corner** October
Nov./Dec.	Work Place Guides for Work Places 3A, 3B, 3C, 3D, 3E	Observation	**Bridges** Unit 3
	Unit 3 Pre-Assessment	Pre-Assessment	**Bridges** Unit 3, Module 1, Session 1
	Decimal Equivalencies Work Sample	Work Sample	**Bridges** Unit 3, Module 2, Session 3
	Decimal Place Value Checkpoint 1	Mid-Unit Checkup	**Bridges** Unit 3, Module 2, Session 4
	Decimal Place Value Checkpoint 2	Mid-Unit Checkup	**Bridges** Unit 3, Module 3, Session 1
	Unit 3 Post-Assessment	Post-Assessment	**Bridges** Unit 3, Module 4, Session 4
January	Work Place Guides for Work Places 4A, 4B, 4C, 4D, 4E	Observation	**Bridges** Unit 4
	Unit 4 Pre-Assessment	Pre-Assessment	**Bridges** Unit 4, Module 1, Session 1
	Multiplication Work Sample	Work Sample	**Bridges** Unit 4, Module 2, Session 1
	Multiplication & Division Checkpoint	Mid-Unit Checkup	**Bridges** Unit 4, Module 2, Session 4
	Multiplication Algorithm Checkpoint	Mid-Unit Checkup	**Bridges** Unit 4, Module 4, Session 1
	Unit 4 Post-Assessment	Post-Assessment	**Bridges** Unit 4, Module 4, Session 5
	Number Corner Checkup 2	Quarterly Assessment of Skills	**Number Corner** January

	Assessment Title	Assessment Type	Location
February	Work Place Guides for Work Places 5A, 5B	Observation	**Bridges** Unit 5
	Unit 5 Pre-Assessment	Pre-Assessment	**Bridges** Unit 5, Module 1, Session 1
	Whole Number Times a Fraction Checkpoint	Mid-Unit Checkup	**Bridges** Unit 5, Module 2, Session 1
	Fraction Times Fraction Checkpoint	Mid-Unit Checkup	**Bridges** Unit 5, Module 3, Session 4
	Unit 5 Post-Assessment	Post-Assessment	**Bridges** Unit 5, Module 4, Session 6
March	Work Place Guides for Work Places 6A, 6B, 6C	Observation	**Bridges** Unit 6
	Unit 6 Pre-Assessment	Pre-Assessment	**Bridges** Unit 6, Module 1, Session 1
	Graphing Patterns Checkpoint	Mid-Unit Checkup	**Bridges** Unit 6, Module 1, Session 7
	Shape Classification Checkpoint	Mid-Unit Checkup	**Bridges** Unit 6, Module 3, Session 1
	Multiplying Mixed Numbers & Fractions Checkpoint	Mid-Unit Checkup	**Bridges** Unit 6, Module 4, Session 3
	Unit 6 Post-Assessment	Post-Assessment	**Bridges** Unit 6, Module 4, Session 4
	Number Corner Checkup 3	Quarterly Assessment of Skills	**Number Corner** March
April	Work Place Guides for Work Places 7A, 7B	Observation	**Bridges** Unit 7
	Unit 7 Pre-Assessment	Pre-Assessment	**Bridges** Unit 7, Module 1, Session 1
	Division Checkpoint	Mid-Unit Checkup	**Bridges** Unit 7, Module 1, Session 6
	Division Problems Work Sample	Work Sample	**Bridges** Unit 7, Module 1, Session 6
	Fraction Division Checkpoint	Mid-Unit Checkup	**Bridges** Unit 7, Module 2, Session 4
	Powers of Ten Checkpoint	Mid-Unit Checkup	**Bridges** Unit 7, Module 4, Session 1
	Unit 7 Post-Assessment	Post-Assessment	**Bridges** Unit 7, Module 4, Session 4
May/June	Choosing Our Materials	Work Sample (optional; no scoring guide provided)	**Bridges** Unit 8, Module 1, Session 5
	Student Model House Designs	Work Sample (optional; no scoring guide provided)	**Bridges** Unit 8, Module 3, Session 5
	Testing Our Final Houses	Work Sample (optional; no scoring guide provided)	**Bridges** Unit 8, Module 4, Session 1
	Number Corner Checkup 4	Quarterly Assessment of Skills	**Number Corner** May
	Grade 5 Comprehensive Growth Assessment (CGA)*	Comprehensive Skills Assessment	**Bridges Assessment Guide** Comprehensive Growth Assessment

* The Grade 5 Comprehensive Growth Assessment (CGA) addresses every Common Core standard for fifth grade. It can be administered at the end of the school year as a summative assessment of all the CCSS for Grade 5, administered twice or even three times over the course of the year to monitor students' progress toward mastering the Common Core State Standards, or used as a flexible bank of test items. See the Comprehensive Growth Assessment part of this guide for more details.

Section 2

Assessing Math Content

Setting Our Targets: Desired Learning Outcomes for Grade 5

In a 2012 article titled "From Common Core Standards to Curriculum: Five Big Ideas," assessment specialists Jay McTighe and Grant Wiggins remind us that the Common Core Standards were developed with long-term outcomes in mind. The authors further explain that the Common Core State Standards were designed to help educators "construct plans for what learners should be able to *accomplish* with learned content," rather than develop checklists of discrete skills to be "covered" at each grade level.

Since it is impossible to construct or administer assessments without clear targets in mind, let's take a minute to envision the Common Core fifth grader. If a 10- or 11-year-old student were fully immersed in a classroom in which the Common Core Standards were well and skillfully addressed, what would that child be able to do by the end of fifth grade?

Perhaps the best answer comes from the Common Core document itself. Text on page 33 characterizes the desired results of fifth grade instruction in this way:

> (1) Students [will] apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They [will] develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students [will] also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)
>
> (2) Students [will] develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They [will] finalize fluency with multi-digit addition, subtraction, multiplication, and division. They [will] apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They [will] develop fluency in these computations, and make reasonable estimates of their results. Students [will] use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They [will] compute products and quotients of decimals to hundredths efficiently and accurately.
>
> (3) Students [will] recognize volume as an attribute of three-dimensional space. They [will come to] understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They [will also come to] understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They [will] select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They [will] decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They [will] measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

To maximize the instructional value of assessment, teachers need to move beyond a superficial 'right or wrong' analysis of tasks to a focus on how students are thinking about the tasks. Efforts should be made to identify valuable student insights on which further progress can be based rather than to concentrate solely on errors or misconceptions. […] Assembling evidence from a variety of sources is more likely to yield an accurate picture of what each student knows and is able to do.

» NCTM

Critical Areas of Focus

The description above reflects the Critical Areas of Focus for Grade 5. The authors of the Common Core Standards point out that, "Not all of the content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, or their importance to future mathematics or the demands of college and career readiness."

The chart below, taken from the "Major Emphases and Shifts in Mathematics" document developed by the Common Core State Standards Initiative, shows the major, supporting, and additional clusters for Grade 5. In this chart, we see that place value and operations with multi-digit whole numbers and decimals, operations with fractions, and volume are deemed more important than skills and concepts related to algebraic thinking, measurement conversions, data, and geometry.

Cluster	Major Clusters	Supporting Clusters	Additional Clusters
Operations and Algebraic Thinking			
Write and interpret numerical expressions.			●
Analyze patterns and relationships.			●
Number and Operations in Base Ten			
Understand the place value system.	●		
Perform operations with multi-digit whole numbers and with decimals to hundredths.	●		
Number and Operations—Fractions			
Use equivalent fractions as a strategy to add and subtract fractions.	●		
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	●		
Measurement and Data			
Convert like measurement units within a given measurement system.		●	
Represent and interpret data.		●	
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	●		
Geometry			
Graph points on the coordinate plane to solve real-world and mathematical problems.			●
Classify two-dimensional figures into categories based on their properties.			●

Assessments in Grade 5 Bridges reflect these emphases. If you examine the Assessment Map at the end of this section, you'll notice that many of the skills and concepts related to place value, multi-digit computation, operations with decimals and fractions, and volume are assessed several or more times throughout the year. By contrast, skills related to algebraic thinking, measurement, data representation and analysis, and geometry receive less attention, and the assessment of these skills is generally tied more tightly to the period of instruction in the program rather than being spread over the year.

Another reason for the discrepancy in the number of times each skill is assessed is that some of the skills are more granular than others, even skills that fall within major clusters. For example, standard 5.MD.3a, which falls within the cluster of skills related to volume, asks that students demonstrate understanding of the fact that volume is measured with cubic units, and that a cube with side length 1 unit is said to have 1 cubic unit of volume. While important, and certainly foundational to the notion of volume, this standard represents a smaller piece of the puzzle than, say, related standards that ask fifth graders to find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, show that the result is the same as would be found by multiplying the edge lengths, and represent threefold whole-number products as volumes.

Levels of Cognitive Demand

Along with a tighter focus on fewer skills at each grade level, the authors of the Common Core Standards call for greater levels of rigor in instruction, citing the need to help students develop conceptual understanding, procedural skill and fluency, and the ability to apply math concepts in "real world" situations.

The call for rigor demands that we make efforts to assess students accordingly, especially when grade-level standards call for understanding, analysis, or fluency. This is why some of the assessments in Grade 5 involve observation rather than written tasks, and written tasks often ask the students to show their work, explain their reasoning, or justify their responses.

One construct that has proved useful in designing the instruction and assessment in Bridges is the Depth of Knowledge scheme developed by Dr. Norman Webb at the University of Wisconsin. Dr. Webb points out that the expectations at a given grade level involve different degrees of cognitive demand, and sets out the following levels for educators to consider in developing instructional activities and assessment tasks.

Level 1: Recall & Reproduction
Recall, recognition; skill, behavior or sequence of behaviors learned through practice and easily performed

Level 2: Skills & Concepts
Engagement of some mental processing beyond recalling; the use of information or conceptual knowledge; requires making some decisions regarding how to approach a question or problem

Level 3: Strategic Thinking
More sophisticated reasoning and analysis; deep understanding; students are required to solve problems & draw conclusions

Level 4: Extended Thinking
Requires integration of knowledge from multiple sources and ability to represent knowledge in a variety of ways; usually requires work over an extended period of time

The chart that follows indicates the level of cognitive demand involved in several different CCSS standards for Grade 5 and outlines the types of assessment tasks needed to elicit corresponding levels of thinking from the student.

	Common Core Standard	Sample Assessment Task
Level 1: Recall	**5.NBT.3a.** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.	Give students a decimal number in expanded form, and ask them to write it with base-ten numerals and number names.
Level 2: Skills & Concepts	**5.NBT.6.** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, or area models.	Pose a multi-digit division problem. Ask the student to choose a model and strategy well-suited to the numbers involved, and show his work, using equations or labeled sketches as needed.
Level 3: Strategic Thinking	**5.NF.6** Solve story problems involving multiplication of fractions and mixed numbers.	Introduce the fact that flags of different countries are made with different width-to-length ratios. Have students draw up plans for their own flags based on one of these ratios, but require that they all use a 9-inch width. Have them calculate the dimensions and area of their flag, and create a scaled and labeled sketch.
Level 4: Extended Thinking	**5.NBT.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on properties of operations.	After they've spent several weeks investigating different aspects of solar energy and ways to collect and store the sun's rays, have students work in teams to design and build model solar houses. Give each team a budget and a collection of differently priced insulating materials, then challenge them to figure out how to achieve the best energy efficiency for their money.

Targets for Mastery

The Assessment Map at the end of this section indicates when mastery of each standard is expected. In looking over the map, you might notice more skills and concepts targeted for mastery during the latter part of the year than during the first 3–4 months of school. It is tempting, and not unusual, for a program or a district to divide a set of grade-level standards into three or four roughly equal piles and target each pile for mastery by the end of a particular quarter or trimester. However, this approach disregards the fact that skills and concepts involving higher levels of cognitive demand require more time to develop than others. It also tends to trivialize learning by breaking skills and concepts into small bits, rather than retaining the connections among them that support the focus, coherence, and rigor demanded by the Common Core Standards.

The fact is that most of the new fifth grade standards involve a degree of cognitive demand beyond Level 1 (recall and recognition). Even a relatively simple skill, such as multiplying a whole number by a fraction, is made more complex in that students are expected to understand and be able to explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number, and why multiplying the same number by a fraction less than 1 results in a product smaller than the given number. Furthermore, this particular skill is part of a larger conceptual cluster that requires deep understandings of multiplication, as well as fractions as numbers in their own right.

Standard 5.NBT.7 provides another good example of the rigor and complexity the Common Core Standards demand. This standard has to do with adding, subtracting, multiplying, and dividing decimals to hundredths. In addition to using concrete models or sketches and strategies based on place value, properties, and relationships between the operations, fifth graders are expected to be able to use written numbers and symbols to represent strategies for computing with decimals, and explain the reasoning behind these strategies. This approach, based as it is in conceptual understanding, precludes the time-honored technique of having students perform the operations as if the quantities were whole numbers, and then teaching them tricks for placing the decimal point correctly. To solve a division problem like 26.75 ÷ 0.10, for instance, and truly understand how and why the quotient turns out to be 10 times as much as the dividend (267.50) requires that students possess a rich network of skills and concepts about the interaction between division and decimals. Such robust understandings take time and many varied layers of experience and application to develop. While we might reasonably expect incremental progress through the year in the three major fifth grade learning progressions (multi-digit computation with whole numbers and decimals, fraction operations, and volume), the whole of each progression is much greater than the sum of a set of discrete parts. We best serve our students by viewing each unit of instruction as another layer in a yearlong journey toward mastery.

Grade 5 Assessment Map

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
3.OA.7 Recall from memory all products of two 1-digit numbers		●												
3.OA.7 Fluently divide with dividends to 100 using strategies		●												
4.OA.2 Solve story problems involving a multiplicative comparison using multiplication or division		●												
4.OA.3 Solve multi-step story problems posed with whole numbers and having whole number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	M1, S3 Unit 1 Pre-Assessment M4, S5 Unit 1 Post-Assessment	●												
4.OA.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.		●		●										
4.NBT.4 Use the standard algorithms with fluency to add and subtract multi-digit whole numbers		●												
4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations.	M1, S3 Unit 1 Pre-Assessment M4, S5 Unit 1 Post-Assessment	●												
4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, or the relationship between multiplication and division.	M1, S3 Unit 1 Pre-Assessment M4, S5 Unit 1 Post-Assessment	●												
4.NF.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.		●												
4.NF.2 Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions.		●												
4.NF.3c Add and subtract mixed numbers with like denominators.		●												
4.NF.3d Solve story problems involving addition and subtraction of fractions referring to the same whole and having like denominators.		●												
4.NF.4a Demonstrate an understanding that a fraction a/b is a multiple of the unit fraction $1/b$		●												

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Rose indicates Bridges unit or Number Corner month in which a skill is targeted for mastery.

Yellow indicates review and extension of a Grade 3 or 4 skill.

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
4.NF.4c Solve story problems that involve multiplying a fraction by a whole number		●												
4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100		●												
4.NF.5 Add a fraction with denominator 10 to a fraction with denominator 100 by rewriting the first fraction as an equivalent fraction with denominator 100		●												
4.NF.6 Write fractions with denominators 10 or 100 in decimal notation		●												
4.NF.7 Compare two decimals to hundredths by reasoning about their size. Record the results of comparisons with the symbols >, =, or <.		●												
5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	M1, S3 Unit 1 Pre-Assessment M2, S1 Numerical Expressions Checkpoint M2, S5 Boxes Work Sample M4, S5 Unit 1 Post-Assessment			●			●							●
5.OA.2 Write simple expressions to record calculations with numbers, and interpret numerical expressions without evaluating them.	M1, S3 Unit 1 Pre-Assessment M2, S1 Numerical Expressions Checkpoint M2, S5 Boxes Work Sample M3, S2 Multiplication & Volume Checkpoint M4, S5 Unit 1 Post-Assessment			●		M1, S1 Unit 4 Pre-Assessment M4, S5 Unit 4 Post-Assessment								●
5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.									M1, S1 Unit 6 Pre-Assessment M1, S7 Graphing Patterns Checkpoint M4, S4 Unit 6 Post-Assessment					●
5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.					M2, S4 Decimal Place Value Checkpoint 1						M4, S1 Powers of Ten Checkpoint			●
5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.					M1, S1 Unit 3 Pre-Assessment M4, S4 Unit 3 Post-Assessment						M1, S1 Unit 7 Pre-Assessment M4, S1 Powers of Ten Checkpoint M4, S4 Unit 7 Post-Assessment			●

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
5.NBT.3a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.					M1, S1 Unit 3 Pre-Assessment M2, S4 Decimal Place Value Checkpoint 1 M4, S4 Unit 3 Post-Assessment									●
5.NBT.3b Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.					M1, S1 Unit 3 Pre-Assessment M2, S3 Decimal Equivalencies Work Sample M2, S4 Decimal Place Value Checkpoint 1 M3, S1 Decimal Place Value Checkpoint 2 M4, S4 Unit 3 Post-Assessment								●	●
5.NBT.4 Use place value understanding to round decimals to any place.					M1, S1 Unit 3 Pre-Assessment M3, S1 Decimal Place Value Checkpoint 2 M4, S4 Unit 3 Post-Assessment									●
5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.						M1, S1 Unit 4 Pre-Assessment M4, S1 Multiplication Algorithm Checkpoint M4, S5 Unit 4 Post-Assessment						M3, S4 and M3, S5 Work Samples*		●
5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, or area models.	M3, S2 Multiplication & Volume Checkpoint M4, S5 Unit 1 Post-Assessment			●	M1, S1 Unit 3 Pre-Assessment M4, S4 Unit 3 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M2, S4 Multiplication & Division Checkpoint M4, S5 Unit 4 Post-Assessment	●		M1, S1 Unit 6 Pre-Assessment M4, S4 Unit 6 Post-Assessment		M1, S1 Unit 7 Pre-Assessment M1, S6 Division Checkpoint M2, S2 Division Problems Work Sample M4, S4 Unit 7 Post-Assessment	M3, S4 and M3, S5 Work Samples*	●	●
5.NBT.7 Add and subtract decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.					M1, S1 Unit 3 Pre-Assessment M2, S4 Decimal Place Value Checkpoint 1 M3, S1 Decimal Place Value Checkpoint 2 M4, S4 Unit 3 Post-Assessment		●			●		M3, S4 and M3, S5 Work Samples*	●	●

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
5.NBT.7 Multiply and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, or the relationship between multiplication and division and subtraction; relate the strategy to a written method and explain the reasoning used.					M1, S1 Unit 3 Pre-Assessment M4, S4 Unit 3 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M2, S1 Multiplication Work Sample M2, S4 Multiplication & Division Checkpoint M4, S5 Unit 4 Post-Assessment	●			●	M1, S1 Unit 7 Pre-Assessment M4, S1 Powers of Ten Checkpoint M4, S4 Unit 7 Post-Assessment		●	●
5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.			M1, S2 Unit 2 Pre-Assessment M1, S5 Fractions Work Sample M2, S6 Fraction Addition & Subtraction Checkpoint M3, S3 Working with Fractions Checkpoint M3, S6 Unit 2 Post-Assessment	●			●			●			●	●
5.NF. 2 Solve story problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.			M1, S2 Unit 2 Pre-Assessment M2, S6 Fraction Addition & Subtraction Checkpoint M3, S3 Working with Fractions Checkpoint M3, S6 Unit 2 Post-Assessment				●			●			●	●
5.NF.3 Interpret a fraction as division of the numerator by the denominator *(a/b = a ÷ b)*. Solve story problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.			M1, S2 Unit 2 Pre-Assessment M2, S6 Fraction Addition & Subtraction Checkpoint M3, S3 Working with Fractions Checkpoint M3, S6 Unit 2 Post-Assessment							●			●	●
5.NF.4a Interpret the product *(a/b) × q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b*.			M1, S2 Unit 2 Pre-Assessment M2, S6 Fraction Addition & Subtraction Checkpoint M3, S3 Working with Fractions Checkpoint M3, S6 Unit 2 Post-Assessment			M1, S1 Unit 4 Pre-Assessment M4, S5 Unit 4 Post-Assessment	●	M1, S1 Unit 5 Pre-Assessment M2, S1 Whole Number Times a Fraction Checkpoint M3, S4 Fraction Times Fraction Checkpoint M4, S6 Unit 5 Post-Assessment	M4, S3 Multiplying Mixed Numbers & Fractions Checkpoint	●		M3, S4 and M3, S5 Work Samples*	●	●

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
5.NF.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.								M1, S1 Unit 5 Pre-Assessment M3, S4 Fraction Times Fraction Checkpoint M4, S6 Unit 5 Post-Assessment	M4, S3 Multiplying Mixed Numbers & Fractions Checkpoint			M3, S5 Work Sample*	●	●
5.NF.5a Interpret multiplication as scaling (resizing) by comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.								M1, S1 Unit 5 Pre-Assessment M3, S4 Fraction Times Fraction Checkpoint M4, S6 Unit 5 Post-Assessment						●
5.NF.5b Interpret multiplication as scaling (resizing) by explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number; explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.								M1, S1 Unit 5 Pre-Assessment M3, S4 Fraction Times Fraction Checkpoint M4, S6 Unit 5 Post-Assessment						●
5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers.									M4, S3 Multiplying Mixed Numbers & Fractions Checkpoint					●
5.NF.7a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.								M1, S1 Unit 5 Pre-Assessment M4, S6 Unit 5 Post-Assessment			M1, S1 Unit 7 Pre-Assessment M2, S4 Fraction Division Checkpoint M4, S4 Unit 7 Post-Assessment		●	●
5.NF.7b Interpret division of a whole number by a unit fraction, and compute such quotients.								M1, S1 Unit 5 Pre-Assessment M4, S6 Unit 5 Post-Assessment			M1, S1 Unit 7 Pre-Assessment M2, S2 Division Problems Work Sample M2, S4 Fraction Division Checkpoint M4, S4 Unit 7 Post-Assessment		●	●

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
5.NF.7c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.								M1, S1 Unit 5 Pre-Assessment M4, S6 Unit 5 Post-Assessment			M1, S1 Unit 7 Pre-Assessment M1, S6 Division Checkpoint M2, S2 Division Problems Work Sample M2, S4 Fraction Division Checkpoint M4, S4 Unit 7 Post-Assessment		●	●
5.MD.1 Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real world problems.					M1, S1 Unit 3 Pre-Assessment M4, S4 Unit 3 Post-Assessment		●			●		M3, S4 and M3, S5 Work Samples*	●	●
5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Use operations on fractions for this grade to solve problems involving information presented in line plots.							●			●				●
5.MD.3a Recognize volume as an attribute of solid figures and understand concepts of volume measurement. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	M3, S2 Multiplication & Volume Checkpoint													●
5.MD.3b A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	M1, S3 Unit 1 Pre-Assessment M2, S5 Boxes Work Sample M3, S2 Multiplication & Volume Checkpoint M4, S5 Unit 1 Post-Assessment													●
5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	M3, S2 Multiplication & Volume Checkpoint													●
5.MD.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.	M1, S3 Unit 1 Pre-Assessment M3, S2 Multiplication & Volume Checkpoint M4, S5 Unit 1 Post-Assessment			●								M3, S5 Work Sample*		●
5.MD.5b Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.				●					M1, S1 Unit 6 Pre-Assessment M4, S4 Unit 6 Post-Assessment	●		M3, S5 Work Sample*		●

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Grade 5 Assessment Map

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	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	March NC	Bridges Unit 7	Bridges Unit 8	May NC	CGA
5.MD.5c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.				●			●		M1, S1 Unit 6 Pre-Assessment M4, S4 Unit 6 Post-Assessment	●				●
5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond.				●			●		M1, S1 Unit 6 Pre-Assessment M1, S7 Graphing Patterns Checkpoint M4, S4 Unit 6 Post-Assessment M4, S4 Unit 6 Post-Assessment	●				●
5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.									M1, S1 Unit 6 Pre-Assessment M1, S7 Graphing Patterns Checkpoint M4, S4 Unit 6 Post-Assessment	●		M4, S1 Work Sample*		●
5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.							●		M1, S1 Unit 6 Pre-Assessment M3, S1 Shape Classification Checkpoint M4, S4 Unit 6 Post-Assessment					●
5.G.4 Classify two-dimensional figures in a hierarchy based on properties.							●		M1, S1 Unit 6 Pre-Assessment M3, S1 Shape Classification Checkpoint M4, S4 Unit 6 Post-Assessment					●

NC – Number Corner, **M#** – Module number, **S#** – Session number, **CGA** – Comprehensive Growth Assessment
* Work Samples in Unit 8 are optional, and no scoring guide is provided.

Rose indicates Bridges unit or Number Corner month in which a skill is targeted for mastery.

Yellow indicates review and extension of a Grade 3 or 4 skill.

Section 3

Assessing Math Practices

In addition to presenting a set of math content standards for each grade level, the authors of the Common Core Standards have established a set of Mathematical Practice Standards that rest on important "processes and proficiencies with longstanding importance in mathematics education." This set is identical for each grade level, K–12.

Dr. William McCallum, one of the authors of the CCSS, points out that the eight math practices can be grouped into four categories, as shown on the chart below.

Habits of Mind of a Productive Mathematical Thinker **MP.1** Make sense of problems and persevere in solving them. **MP.6** Attend to precision.	**Reasoning and Explaining** **MP.2** Reason abstractly and quantitatively. **MP.3** Construct viable arguments and critique the reasoning of others.
	Modeling and Using Tools **MP.4** Model with mathematics. **MP.5** Use appropriate tools strategically.
	Seeing Structure and Generalizing **MP.7** Look for and make use of structure. **MP.8** Look for and express regularity in repeated reasoning.

It is important to note that these practices reflect the attitudes and ways of thinking and working that characterize successful mathematicians. They are much bigger and somewhat more amorphous than math content skills, and at least as important. However, they are not a list of discrete skills to be "covered." They are, rather, vehicles for teaching, learning, and doing mathematics at every level.

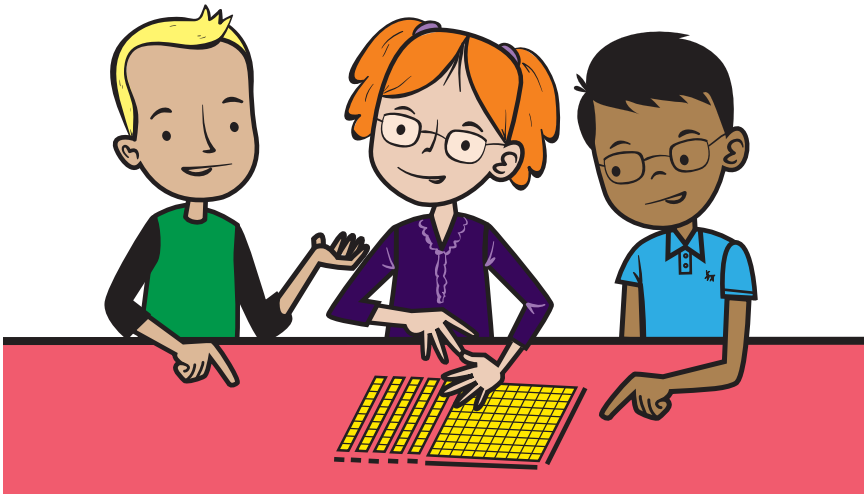
In rich settings in which informal and formal possibilities for solving problems are numerous, young children develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere.

» Juanita Copley

What Do the Math Practices Look Like at Grade 5?

It is impossible to address and assess these practices without having a clear picture of the desired outcomes. The language of the math practices is straightforward, but exactly what does "reasoning abstractly and quantitatively" look like in fifth grade? How do we know when a 10-year-old is proficient at "modeling with mathematics?"

The North Carolina Department of Instruction has produced a document that "unpacks" the Common Core Standards, providing clear descriptions of what the standards mean a student must know, understand, and perform at each grade level. The chart on the next page features explanations and examples of the math practices in action at fifth grade from the North Carolina unpacking document.



Math Practice		Explanations and Examples
Habits of Mind	**MP.1** Make sense of problems and persevere in solving them.	Mathematically proficient students in grade 5 should solve problems by applying their understanding of operations with whole numbers, decimals, and fractions including mixed numbers. They solve problems related to volume and measurement conversions. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves such questions as: "What is the most efficient way to solve the problem?" "Does this answer make sense?" "Can I solve the problem in a different way?"
	MP.6 Attend to precision.	Mathematically proficient students in grade 5 continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to expressions, fractions, geometric figures, and coordinate grids. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the volume of a rectangular prism they record their answers in cubic units.
Reasoning & Explaining	**MP.2** Reason abstractly and quantitatively.	Mathematically proficient fifth graders should recognize that a number represents a specific quantity. They connect quantities to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities. They extend this understanding from whole numbers to their work with fractions and decimals. Students write simple expressions that record calculations with numbers and represent or round numbers using place value concepts.
	MP.3 Construct viable arguments and critique the reasoning of others.	In fifth grade, mathematically proficient students explain their thinking to others and respond to others' thinking. They may construct arguments using concrete referents, such as objects, pictures, and drawings. They explain calculations based upon models and properties of operations and rules that generate patterns. They demonstrate and explain the relationship between volume and multiplication. They refine their mathematical communication skills as they participate in mathematical discussions posing such questions as: "How did you get your answer?" "Why is that true?" "Why does it work that way?" "Do you think it will always work, or can we come up with an example that doesn't?"
Modeling & Using Tools	**MP.4** Model with mathematics.	Mathematically proficient students in grade 5 experiment with representing problem situations in multiple ways including numbers, words (mathematical language), making labeled sketches, using objects, making a chart, list, or graph, creating equations, and so on. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Fifth graders should evaluate their results in the context of the situation and whether the results make sense. They also evaluate the utility of models to determine which models are most useful and efficient to solve problems.
	MP.5 Use appropriate tools strategically.	Mathematically proficient fifth graders consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use unit cubes to fill a rectangular prism and then use a ruler to measure the dimensions. They use graph paper to accurately create graphs and solve problems or make predictions from real world data, or might elect to use spreadsheet software instead.
Structure & Generalizing	**MP.7** Look for and make use of structure.	In fifth grade mathematically proficient students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to add, subtract, multiply and divide with whole numbers, fractions, and decimals. They examine numerical patterns and relate them to a rule or a graphical representation.
	MP.8 Look for and express regularity.	Mathematically proficient fifth graders use repeated reasoning to understand algorithms and make generalizations about patterns. Students connect place value and their prior work with operations to understand algorithms to fluently multiply multi-digit numbers and perform all operations with decimals to hundredths. Students explore operations with fractions with visual models and begin to formulate generalizations.

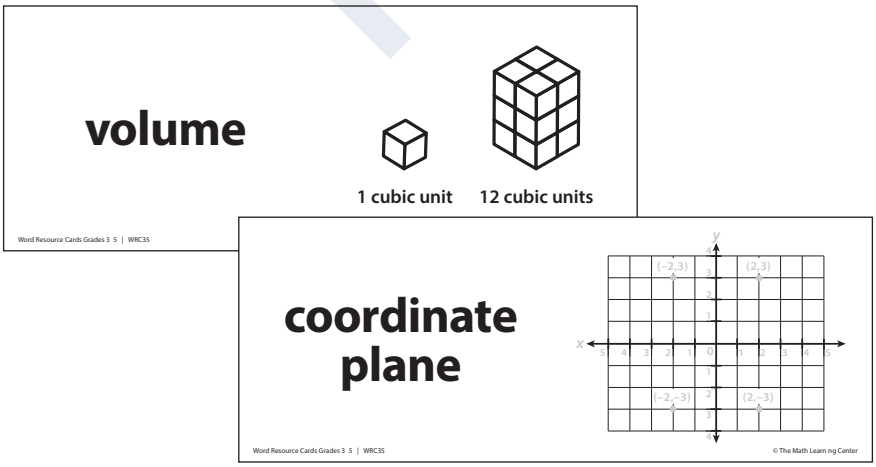
How Can We Best Assess the Math Practices?

While it is possible to score extended response items for a variety of traits, much as writing samples are scored, the characteristics, habits of mind, and dispositions represented by the math practices don't easily lend themselves to paper-and-pencil testing, especially in the elementary grades. We need to observe our students in action during daily instruction, at Work Places, and in individual and small group settings, watching and listening carefully for evidence that they are demonstrating the desired proficiencies and performances.

What Is the Teacher's Role in Eliciting Math Practices?

As we consider how to best teach and assess math practices, we need to examine the teacher's role as a facilitator in the classroom. What behaviors and attitudes can we hold and model on a consistent basis, whether in instructional or assessment settings, that will elicit and reinforce the practices?

- **Value the process of finding the answer at least as much as the answer itself.** This means listening carefully to students and trying to understand how they get their answers, even when they don't make much sense to you. Students' responses, as random as they may seem at times, are based on their current understandings. There is almost always some kind of underlying logic.
- **Create an atmosphere in which it's OK to take risks and make mistakes.** If you listen to students with genuine respect and curiosity, you'll find that they begin to do the same for their classmates.
- **When appropriate, make a selection of tools available,** including pattern blocks, base ten pieces, colored tiles, geoboards, whiteboards and markers, paper and pencil, and virtual tools such as the number line, geoboard, and number pieces apps, as well as spreadsheet software. Talk with students about their choices from time to time, and encourage them to explain why, for example, they've chosen to make a sketch of an open array instead of using a ratio table to model and solve a particular problem.
- **Give students time to share their observations, ideas, and strategies with one another.** This can take place in small group settings such as Work Places, or during whole group discussions, but means that you have to establish the idea of listening to and learning from one another as a classroom norm. The care and respect you demonstrate in listening to each member of your classroom community will shape students' attitudes toward one another.
- **Encourage students to be as precise as possible in their use of mathematical terms and labels.** The level of precision your fifth graders are able to exercise will vary from one student to the next, depending on a variety of factors, but you can be consistent in using precise terminology yourself. To support you in this effort, we have provided a list of math vocabulary on the first page of each session and workout throughout Bridges and Number Corner, as well as a set of Word Resource Cards (found in the Number Corner kit). Each card in the set shows a word or term along with an illustration of its meaning. A working definition is provided on the back of each card for your reference. We recommend that you use these cards to develop math word walls over the course of each unit or month of Number Corner by posting them as the need arises during your instruction. These illustrated terms and definitions are also available as an app (Math Vocabulary Cards) that serves as a compact and convenient math dictionary.



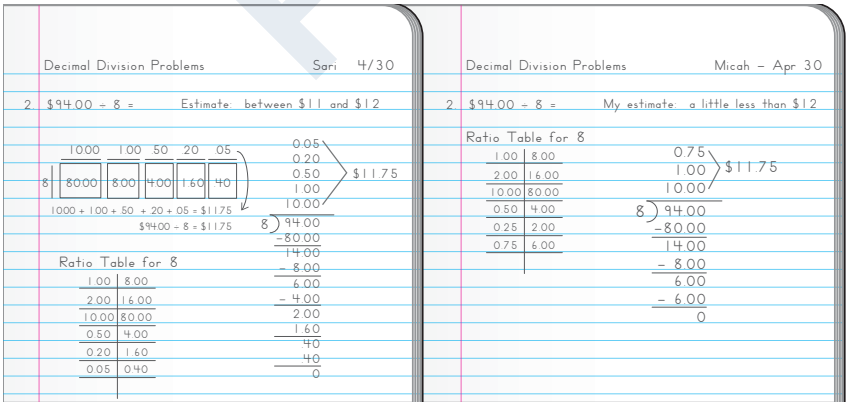
- **Help students clarify and justify their thinking with the questions you ask** as they are working independently or discussing problems in group settings. We have included sample dialog in many of the Bridges sessions and Number Corner workouts for modeling possible questioning techniques. Beyond these examples, we find that there are key questions that elicit specific math practices. Some of these are listed on the following chart.

Math Practice		Questions That Elicit the Desired Behavior
Habits of Mind	**MP.1** Make sense of problems and persevere in solving them. **MP.6** Attend to precision.	• What do you think that problem is asking? • How would you describe this problem in your own words? • What information is given in the problem? • What might you do to get started? • Share your thinking with the person next to you. What does your partner think? • Did your partner get the same answer? If not, can the two of you figure out why not? • What's the word we use for any shape with 2 pairs of parallel sides? • What unit of measure would be the most sensible for your purposes? Why? • What measuring tool would give you the most precise answer? • Does your answer seem reasonable? Why or why not? • What can you do to double-check your answer?
Reasoning & Explaining	**MP.2** Reason abstractly and quantitatively. **MP.3** Construct viable arguments and critique the reasoning of others.	• Now that you've drawn 4 number cards, what two fractions will you form with them to get a sum as close as possible to 1? • Which team is winning our game so far? By how much? • What numbers do you hope you roll next in this game? Why? • What does each of the numbers and symbols in this problem mean? • What equation might we use to represent this story problem? Does someone have a different idea? • What answer did you get for this problem? How did you figure it out? • Does anyone have a different solution? • Does anyone have a different strategy; a different way to solve the problem? • We have seen three different strategies for solving this problem. How are these strategies alike? How are they different? • Did anyone try a method that didn't work? Why didn't it work? Do you think it would ever work? Why or why not? • Can you convince us? • Can you find a way to prove that?
Modeling & Using Tools	**MP.4** Model with mathematics. **MP.5** Use appropriate tools strategically.	• Can you make a labeled sketch to show your thinking? • What equation might we use to represent this situation? • Would you prefer to use an open array or a ratio table to help solve this problem? Why? • How might you use base ten pieces to show this situation? • Would you rather use one of the geoboards from our collection of math tools, or the geoboard app on your tablet today? Why?
Structure & Generalizing	**MP.7** Look for and make use of structure. **MP.8** Look for and express regularity.	• What do you notice (about this chart, game board, diagram, sequence, problem, etc.)? • Do you see any patterns in the number of tiles it takes to build each arrangement in this sequence? • What might come next? Why? • What do you predict will happen? Why? • How is this problem like the one we just solved? How is it different? • Does that always work? Why or why not? • What would happen if … ? • How are these shapes alike? How are they different? • What do you notice about the numbers in this list?

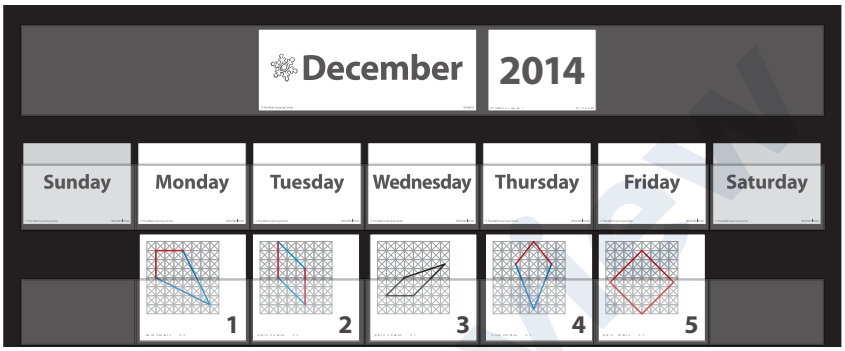
Looking for the Math Practices in All the Right Places, Part 1

Although teachers' beliefs and attitudes regarding the math practices shape their questioning and instructional strategies and go a long way toward eliciting the desired behaviors, we need to acknowledge that certain types of activities are more effective than others in educing particular practices. To say that we're doing all the math practices all of the time strips them of their fundamental value.

Math educator Susan Jo Russell suggests instead that we identify "Content-Practice nodes" or places in a curriculum where a teaching/learning emphasis on each practice can most productively occur. The chart below identifies some of the types of activities in Bridges and Number Corner that are particularly strong at facilitating each practice in Grade 5, and gives an example of each.

MP	Activity
MP.6 MP.2, MP.3 MP.4, MP.5 MP.8	**Computation Problems That Can Be Solved Using Different Models and Strategies** **Unit 7 Module 4, Session 3** Using Models & Strategies to Divide with Decimals Because fifth graders are asked to divide decimals to hundredths, but not yet expected to use a standard algorithm for the operation, they are at liberty to devise their own strategies. This facilitates the development of deep number and operation sense, as well as a kind of mathematical ownership that does not emerge as strongly when students are asked to replicate a method demonstrated by the teacher. In this example from Unit 7, students are dealing with a story problem that involves dividing $94.00 by 8 to determine an hourly wage. While they don't yet have a standard procedure for handling the problem, they do have several tools at their disposal, including an understanding of the relationship between multiplication and division, the knowledge that they can use familiar multiplication facts to build up to the dividend, and two models that promote this sort of thinking—the ratio table and the area model. The teacher scaffolds students' thinking by asking them to share and discuss estimates first. ***Students*** *Well, $10 an hour would be $80. That's close enough.* *Well, I thought that too, but then you still have almost $15 left. That's almost enough for another $2 per hour.* *I say close to $12 an hour.* *I agree. It's definitely going to be less than $12 an hour, but not by much.* Students are then given time to solve the problem in their journals. As they finish, they share and compare solutions and strategies with others nearby. When most have solved the problem, the teacher solicits and records students' answers, both correct and incorrect, on the board, and invites volunteers to share their work and explain their thinking at the projector.  ***Sari*** *This one was pretty easy at first, but I had to keep adding onto my ratio table to get the answer when it got close.* ***Micah*** *I did it pretty much the same way, but I just used the ratio table and kept track of how much was left after each subtraction on the division box. I did a different thing at the end, though. I cut 0.50 × 8 in half on my ratio table. That was 0.25 × 8, and the answer is 2.00. Then I realized that 3 of those chunks would work for the last $6.00.*

The sessions and workouts shown in the chart are meant to give examples of the types of activities teachers will find throughout the program. Each Bridges session and Number Corner workout is accompanied by a skills list that identifies two or three math practices that are most strongly elicited by the activity. For a complete listing, see the Bridges in Mathematics Grade 5 CCSS Correlations on the Bridges Educator website.

MP	Activity
MP.1 MP.2, MP.3 MP.8	**Pattern Problems** **December Number Corner** Calendar Grid Workout Each month, a new sequence of pocket chart cards, one for each day of the month, is introduced. Every set revolves around one of the key skills or concepts at a particular grade level. The cards are posted one by one through the month, and each week the students discuss the growing collection, looking for patterns that will allow them to make predictions about upcoming cards. In December, the sequence features a repeating pattern of kite, parallelogram, trapezoid. The shapes on the first dozen or so markers are meant to challenge students' ideas about the defining attributes of each kind of shape. For example, is the shape on marker 3, a trapezoid that is not the familiar isosceles trapezoid from the set of pattern blocks, really a trapezoid? If so, what makes a shape a trapezoid? The first two parallelograms are rhombuses, the second of which is also a square (markers 2 and 5). The third parallelogram is not a rhombus, and the fourth parallelogram is a rectangle. The disruption of students' expectations prompts them to find similarities among these figures; in the course of doing that, they clarify that the defining attribute of a parallelogram is that it has 2 pairs of parallel sides. There are more specific kinds of parallelograms, which are defined by additional attributes; they are still parallelograms, but they can also be sorted into narrower categories according to these additional attributes.  Calendar Grid Observations Date / Shape Name / Pairs of Parallel Sides / Pairs of Congruent Sides / Pairs of Congruent Vertices 1 / kite / 0 / 2 / 1, opposite 2 / parallelogram / 2 / 2 / 2, opposite 3 / ? / 1 / 0 / 0 4 / kite / 0 / 2 / 1, opposite 5 / square, rhombus / 2 / All 4 sides are congruent. / all 4 congruent ***Teacher*** *Now that we've examined and described the first 5 markers, what do you think the pattern this month might be? And, what do you think the next marker will look like? Please talk to the person next to you, and then we'll have some people share their thinking with the class.* ***Chang*** *I think it's going kite, rhombus, something else. Kite, rhombus, something else. So the next one should be a something else, because today we had a rhombus.* ***Amber*** *I still don't get why the one for today is a rhombus, though. It's a square tipped up on its point, but why are we saying it's a rhombus?* ***Xavier*** *OK, well, a rhombus has 4 sides that are all the same length, right? So, a square is like a special kind of rhombus—one with all right angles.* ***Kaitlyn*** *I think the something else is always a quadrilateral, though. Both of them have 4 sides. So kite, rhombus, quadrilateral. Repeat.* ***Carlos*** *Yeah, but kites and rhombuses always have 4 sides too. They're quadrilaterals also. So I don't think that makes sense.* ***Shanice*** *It's going to be something weird with 4 sides, like something with no sides the same, all going a different way instead of together.* ***Miguel*** *I agree. I think it'll be like the shape on marker 3, with none of the sides parallel.*

MP	Activity
MP.1 MP.2, MP.3 MP.4, MP.5 MP.7	**Problems with More Than One Solution** **Unit 5 Module 1, Session 2** Target One Fractions In this session, students share some of the strategies they have developed for multiplying whole numbers by common fractions prior to learning a new game. The teacher records students' strategies on a poster for everyone's reference. ***Tyrell*** *First we thought about ⅕ of 3. We did ⅕ of 1 three times and got ⅗. That's ⅕ of 3. Then, we added that 4 times. ⅗ + ⅗ + ⅗ + ⅗ is ¹²⁄₅ or 2 ²⁄₅.* Strategies for Multiplying Whole Numbers & Non-Unit (Common) Fractions Find the unit fraction times the whole number and then sca e up, using multiplication or addition. $3 \times \frac{4}{5} = (3 \times \frac{1}{5}) \times 4 = \frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{12}{5}$ ***Teacher*** *Did someone use a different strategy to solve this problem?* ***Cindy*** *We remembered that ⁴⁄₅ is the same as 0.80 and 80 cents. Once we knew that we just had to find three groups of 80 cents. That's $2.40.* Think about money or decimals. $\frac{4}{5}$ is the same as $0.80, because $\frac{1}{5}$ of a dollar is $0.20 $3 \times 0.80 = 2.40$, which is the same as $2\frac{2}{5}$ ***Eduardo*** *We did it another way. We added ⁴⁄₅ three times, and that's ¹²⁄₅.* Use repeated addition. $3 \times \frac{4}{5} = \frac{4}{5} + \frac{4}{5} + \frac{4}{5} = \frac{12}{5} = 2\frac{2}{5}$ The teacher then introduces a game in which each team gets 5 number cards, out of which 3 are chosen to form a whole number and a fraction that when multiplied, will result in a product as close to 1 as possible. A team's score is the difference between their product and 1. At the end of 5 rounds, teams add up their scores; the lower total wins. For each hand a team draws there are multiple possibilities, and the situation of mild competition encourages students to search for and debate the optimal solution. 2, 3, 3, 5, 8 $\square \times \frac{\square}{\square}$ ***Lui*** *I have one! I'm not sure it is the closest to 1, but it is pretty close. I made 2 the whole number and ⅗ the fraction, and I got ⁶⁄₅ for the answer.* ***Teacher*** *OK. Let's write that on the board. How did you get your answer?* ***Lui*** *Since it's times 2, I just doubled ⅗. That's ⁶⁄₅, which is 1 ⅕, which is just ⅕ away from 1.* ***Willie*** *That's pretty close, Lui, but I got a number even closer to 1. I chose 3 as the whole number and ⅜ as the denominator. Three times ⅜ is ⅜ tripled, so ⅜ + ⅜ + ⅜, which is ⁹⁄₈. That's ⅛ away from 1.* ***Teacher*** *Let's write that one up here as well. Did anyone find a combination that came any closer? No? Which of these two do you want to use, Carmen? You're recording for the class, so you get to decide.* ***Carmen*** *Definitely the one with eighths. That's a really good one.*

Looking for the Math Practices in All the Right Places, Part 2

On the next page, you'll find a Math Practices Observation Sheet. Here you can note observations about students' use of math practices during Bridges sessions and Number Corner workouts. Consider running several copies, labeling each row with one of the students' names, and making periodic notes about each student once every week or two.

Math Practices Observation Chart

You can use this chart to record notes about students' use of Math Practices during Bridges sessions and Work Places, as well as during Number Corner workouts. See the Grade 5 Correlations on the Bridges Educator site for the sessions and workouts most likely to elicit particular Math Practice.

Students	**Habits of Mind** **5.MP.1** Make sense of problems and persevere in solving them **5.MP.6** Attend to precision	**Reasoning & Explaining** **5.MP.2** Reason abstractly and quantitatively **5.MP.3** Construct viable arguments and critique the reasoning of others	**Modeling & Using Tools** **5.MP.4** Model with mathematics **5.MP.5** Use appropriate tools strategically	**Seeing Structure & Generalizing** **5.MP.7** Look for and make use of structure **5.MP.8** Look for and express regularity in repeated reasoning

Section 4

Assessment as a Learning Opportunity

There is no question that fifth graders can participate in an informed way in their own learning, setting goals and monitoring their progress toward meeting those goals. In this section, we will examine several different ways to engage students as active participants in their own learning. These include setting and evaluating learning targets with students each day; utilizing a variety of techniques for bringing each session to some kind of closure; having students reflect on the results of the unit pre-assessments in order to set their own goals for each 4- to 6-week period of study; and giving students the opportunity to compare and contrast their skill levels at the beginning and end of each unit.

Assessment should not merely be done to students; rather it should also be done for [and with] students, to guide and enhance their learning.
» NCTM

Learning Targets

A learning target is, very simply, a statement of intent for a lesson. Such a target lets students know what the goal of the lesson is. Teachers sometimes set two or even three targets for a math session: one that has to do with the content (skills or concepts), one that has to do with key vocabulary, and one that has to do with a mathematical practice likely to be elicited in the course of the activity.

Setting Learning Targets

Each Bridges session includes a summary, list of skills and concepts, and list of related vocabulary to make the task of generating learning targets easier for teachers.

Unit 3 Module 2

Unit 3
Module 2
Session 6

Session 6
Fraction & Decimal Equivalencies

Summary

The session begins with a decimal subtraction string that highlights the constant difference strategy. Then students discuss and complete the Fractions & Decimals Chart they started in the previous session. Students spend the remaining time visiting Work Places.

Skills & Concepts

- Read and write decimals to thousandths represented with base ten numerals (5.NBT.3a)
- Subtract decimals to hundredths, using concrete models or drawings and strategies based on place value and properties of operations (5.NBT.7)
- Construct viable arguments and critique the reasoning of others (5.MP.3)
- Look for and express regularity in repeated reasoning (5.MP.8)

Materials

Copies	Kit Materials	Classroom Materials
Problem String Constant Difference		
		• student math journals
Problems & Investigations Fractions & Decimals Chart		
		• Fractions & Decimals Chart and Decimal Grid Student Book pages (SB 88–90, completed in Session 5) • calculators, class set
Work Places in Use		
2B Racing Fractions (introduced in Unit 2, Module 2, Session 2) **2C** Target Practice (introduced in Unit 2, Module 2, Session 5) **3A** Beat the Calculator: Fractions (introduced in Unit 3, Module 1, Session 3) **3B** Draw & Compare Decimals (introduced in Unit 3, Module 2, Session 1) **3C** Round & Add Tenths (introduced in Unit 3, Module 2, Session 3) **3D** Target One (introduced in Unit 3, Module 2, Session 4)		
Daily Practice		
SB 92 Decimal Practice		

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master
Copy instructions are located at the top of each teacher master.

A teacher might examine the Summary and Skills & Concepts list for a session such as the one shown above, and devise one, two, or even three learning targets in the form of "I can" statements:

> *I can use an area model to show and solve a problem that involves multiplying one fraction by another fraction.*
>
> *I can explain how and why the area model works for multiplying fractions as well as whole numbers.*
>
> *I can work with the other people at my table to make sense of problems that may seem a little confusing at first.*

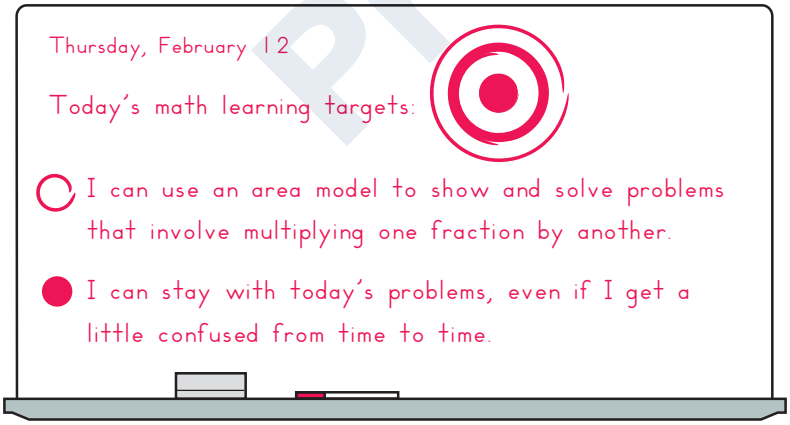
These are only three of a number of possible learning targets for this particular session. Other content targets might deal with constructing rectangles with fractional side-lengths, connecting the dimensions and area of a rectangle to the numbers being multiplied and their product, or starting to make sense of the fact that multiplication of one fraction less than 1 by another fraction less than 1 yields a product that is less than either of the factors. Other vocabulary targets might revolve around any of the words or phrases listed for the session. Alternate math practice targets might have to do with sharing and explaining one's thinking, being able to restate a classmate's explanation or strategy with accuracy and understanding, or using labeled sketches and equations to model and solve word problems. It is not hard to come up with an assortment of possible targets; the challenge is to choose the one or two that best address the strengths and needs of your students at the time and to frame those targets in student-friendly terms (e.g., "I can … " statements).

Teachers generally find that the process of devising learning targets for their students is helpful in focusing their own thinking about the purpose of a lesson. It's not unusual for teachers to collaborate during grade-level team meetings or professional learning communities in generating learning targets for the sessions they plan to teach in the coming week.

Communicating Learning Targets

Once a teacher has decided on the learning targets for a particular session, she must then communicate them to the students. Oftentimes, she does this by writing the targets on the board before the session and then sharing them with the students at the very opening of the session.

Some teachers even make a drawing of a target on the board to accompany the display, like this:



Evaluating Learning Targets

After sharing the targets with the students and clarifying as needed, the teacher conducts the lesson, referring back to each target once or twice during instruction to refocus students on their learning goals. At the end of the activity, the teacher draws students' attention back to the targets and evaluates each with the class, as illustrated in the dialog below.

> ***Teacher*** *Our first learning target today was to use an area model to help solve fraction by fraction multiplication problems. How did we do with that?*
>
> ***Students*** *I think the hardest part was remembering that the whole geoboard was worth 1 instead of 16.*
>
> *I agree. Like when we did the first problem, it was hard to make a rectangle that was ½ by ¼. I kept thinking it was a 2 by 1 on my board.*
>
> *I thought it was a little easier when we started making sketches on those grids in our book.*
>
> *Even then, I kept getting confused about the little squares being 1/16 instead of 1.*
>
> *The thing that seems really weird is how small the answers are. I always thought when you multiply, the number gets bigger, but today when we did stuff like ½ x ¼, the answer turned out to be an eighth, which is smaller than both of the numbers we started with!*
>
> ***Teacher*** *Where would you say we landed on our target for multiplying one fraction by another?*
>
> ***Students*** *Definitely not in the bull's-eye!*
>
> *I'd say we're still in the outer ring on the target. We need more work with multiplying fractions.*
>
> *I was feeling pretty good about stuff like 4 x ⅔, but multiplying two fractions together is harder.*
>
> ***Teacher*** *What about our other target for the day? How did you do at sticking with things, even if you started feeling confused now and then? Let's see a show of thumbs on that one—up if you felt like you were able to stick with it, sideways if you felt like you kind of checked out when you got confused, or down if you couldn't stay with today's problems very well at all. OK… I'm seeing lots of sideways thumbs. We will keep working with fraction by fraction multiplication over the next few sessions, and I think you'll be feeling more confident with the operation soon.*

Bringing Sessions to Closure

While it is generally not reasonable to expect full mastery of any given skill or concept at the end of a single session, you can enhance students' engagement with the learning process by taking care to bring each session to closure, rather than moving too quickly to the next activity. Most of the sessions in Bridges offer summary opportunities of one sort or another. Sometimes these are simple housekeeping procedures, such as having students clean up, put their materials away, and reconvene to find out what they'll be doing the following session. Other times, a session will close with a final problem, a short set of questions, or a journal prompt, making it possible for students to monitor their own progress toward meeting standards on a regular basis.

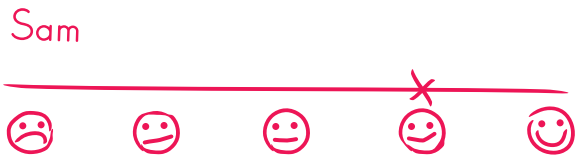
There are many other very effective ways to bring daily sessions to closure in ways that allow students to review and reflect upon the learning that has taken place that day, or their feelings about it. You'll find a few of these described below.

Thumbs Up, Down, or Sideways

Call for a show of thumbs at the end of the session in response to questions that involve students' confidence level with a particular skill, understanding of a particular concept, or feelings about a topic, skill, or concept.

Learning Lines

At the end of a session, have students each draw a line on a whiteboard or small piece of scratch paper and label it with three or more faces, as shown in the illustration. Then have them mark an X along the line to indicate how well they think they did with the skill, concept, or math practice that was targeted for the lesson. (You might also consider drawing up a line like this yourself, running copies on strips of paper, and giving them to the students to mark from time to time. You can also ask students to write a short (one or two sentence) explanation of their mark if you plan to collect the strips.)



Exit Cards

At the end of a session, give students each a 3″ × 5″ index card or a small piece of scratch paper, or have them turn to the next available page in their math journal, and ask them to respond to one of the prompts below, or another of your own choice.

- Three important ideas from today's lesson are _____, _____, and _____, but the most important thing I learned today is _____.
- One question I still have about what we did today is _____.
- One thing I learned about _____ today is _____.

Text Messages

As a variation on the exit cards described above, invite students to explain one thing they learned or one question they still have in the form of a text message, complete with the abbreviations and marks they might use if they were texting a friend.

Error Analysis

Post a problem on the board with an error in the computation or the answer. Have students work independently or in pairs to identify the error, and then talk it over with the group.

Using the Unit Pre-Assessments for Goal Setting

Although teachers sometimes hesitate to administer unit pre-assessments for fear that students may feel overwhelmed and defeated before the instruction even begins, there are a number of good reasons to conduct these assessments. One of the strongest arguments for doing so is that you can use the results to guide your instruction, knowing ahead of time which students are likely to struggle and need extra support, and which are likely to need extra challenges along the way. It's important to reassure students that the unit pre-assessments are designed to help you (and them) understand what they already know and what they still have to learn with regard to the skills and concepts in the upcoming unit. You don't expect them to know how to answer all the questions and solve all the problems yet, but you also don't want to spend lots of time teaching things they can already do. You might encourage your students to regard each pre-assessment as a "sneak preview of coming attractions" or a peek at some of the things they'll be studying over the next few weeks.

Student Reflection Sheets

The results of unit pre-assessments can also provide students with concrete evidence of their current skills relative to what will be addressed during any given unit. We believe there is so much potential in allowing students to take stock of their areas of strength and need at the start of each unit that we have formalized the process by providing a Student Reflection Sheet, as well as time in the first module of instruction, for each unit except the last. The procedure, described below, is the same from one unit to the next, but the reflection sheets are specific to each unit, and are found in the Bridges Teachers Guide.

Bridges in Mathematics Grade 5 Teacher Masters

T8

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Unit 3 Module 1 | **Session 3** *class set, plus 1 copy for display*

NAME | **DATE**

Unit 3 Pre-Assessment Student Reflection Sheet

Skill	Look at these problems.	I can do this well already.	I can do this sometimes.	I need to learn to do this.	Notes
Can you read and write decimal numbers to thousandths in base ten numerals, number names, and expanded form?	1				
Can you compare decimal numbers to thousandths?	2, 3				
Can you round decimal numbers to the nearest 1, the nearest tenth, the nearest hundredth?	4				
Can you add and subtract decimals to hundredths?	5a, 5b, 6				
Can you multiply a number by powers of 10 (10, 100, 1000, and so on), and explain what happens to the number of zeroes in the product and why the decimal point moves over?	7a, 7b, 7c				
Can you multiply and divide numbers by powers of 10 (10, 100, 1000, and so on) to convert among different-sized measurement units in the metric system?	8a–d				
Can you write a story problem to match a division expression and write a division expression to match a story problem?	9a, 10a				
Can you make a labeled sketch on a base-ten grid to model and solve a division problem?	9b, 9c				
Can you solve a division story problem?	10b, 10c				

- After you have made a mark and some notes about each skill above, draw a star next to the two skills that you need to work on the most during this unit.
- Write other ideas about what you want or need to learn how to do during this unit.

To start, you'll hand each student his or her scored assessment and give them a minute or so to look over their papers. Then you'll display a copy of the reflection sheet, give students each a copy, and follow these steps:

- Go over the sheet, one row at a time, with the class.
- For each row, read the skill and make sure students understand it. Ask volunteers to explain, or use one of the associated items on the pre-assessment to explain the skill to the class.
- Have students look at the assessment item(s) associated with that particular skill, talk in pairs about how they did with the skill, and then mark their reflection sheets accordingly.
- When you and the students have finished working through all the skills listed on the reflection sheet, have students star the two they feel they need to work on most in the next few weeks.
- Finally, give students a couple of minutes to describe in writing any other goals, needs, requests, or questions at the bottom of the sheet.
- When students are finished, collect the unit pre-assessments and student reflection sheets. Staple them together and file them so they can be shared with students at the conclusion of the unit, should you choose to do so. (You might also use students' reflection sheets to conference with them mid-unit regarding their progress on the goals they have set for themselves.)

Before & After

Many fifth graders enjoy comparing the results of their unit pre- and post-assessments, looking to see which items they were able to do correctly the second time around, and noting changes in their organizational skills, the strategies they used to solve various problems, and so on. This is a relatively quick and simple way to help students take ownership, and something you might consider implementing early in the school year. To facilitate this process, you will find a Post-Assessment Student Reflection sheet that closely parallels the Pre-Assessment Reflection sheet for each unit in the Bridges Unit Assessment part of this guide. Whether or not you choose to use these sheets is up to you. Time has not been provided in the sessions, but you may find the specific feedback provided to students worth the extra time and effort involved.

Section 5

Using the Results of Assessment to Inform Differentiation & Intervention

The key to meaningful intervention is for teachers at a grade level to conduct the same assessments, score them the same way, discuss the results with colleagues, and develop a plan that accurately targets and addresses the needs of students.

This time-tested recipe for success has been formalized over the past decade, partly as a result of state and federal demands for increased accountability. The last ten years have seen the rise of professional learning communities, data walls, and Response to Intervention (RtI). At the heart of these developments is the goal of ensuring that *all* students meet the standards and achieve mathematical success.

One of the most challenging tasks we face as classroom teachers is finding ways to reach all our students and match each student's level of mathematical readiness and performance to the skills we are required to teach.

» Regina Gresham and Mary Little

What is RtI?

Succinctly stated by math educators Gina Gresham and Mary Little, Response to Intervention (RtI) is the practice of "1) providing high-quality instruction or intervention matched to student needs and 2) using learning rate over time and level of performance to 3) make important educational decisions to guide instruction."

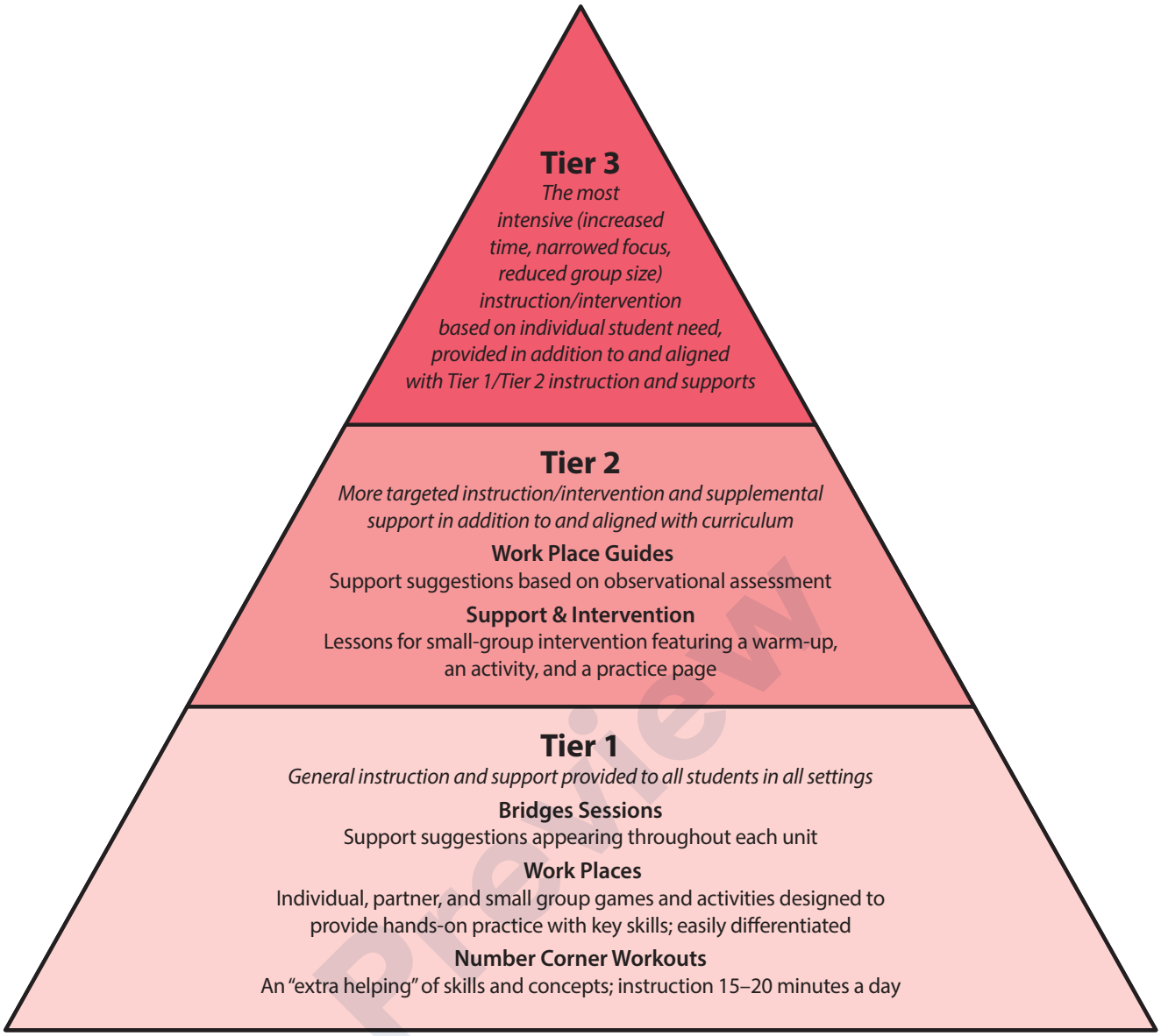
Gresham and Little go on to identify the important role of classroom teachers:

> The RtI process relies on proactive, instructional problem solving among educators to develop dynamic instructional or intervention plans that are based on assessment data and that address academic or behavioral concerns about students. RtI in mathematics focuses on the effective use of evidence-based instructional approaches, resources, and strategies within the classroom while continuously monitoring student learning. Because the goal is to increase mathematical achievement for all students, general education classroom teachers are crucial participants in the RtI process.

How Does Bridges Support RtI?

RtI models generally describe a three-tiered approach to providing instruction and intervention to students at increasing levels of intensity, as determined by student response. Assessment data is collected at each tier in order to make instructional decisions and determine whether or not students are responding to instruction and interventions.

As illustrated in the diagram below, Bridges provides Tier 1 instruction and a solid set of Tier 2 resources, along with the assessments, including recheck opportunities, needed to monitor students' progress. Although Bridges is not designed to deliver Tier 3 instruction (intensive, individualized interventions and support), the models and instructional methods employed throughout the program are highly compatible with those of Math Recovery, a well-regarded Tier 3 program.



Continual use of assessments throughout the school year helps guide decisions about the level of intervention required to ensure success for each student. The following items are part of an instructional path that follows a set of RtI-friendly steps:

1 Conduct Tier 1 instruction for approximately 75 minutes a day following the sequence laid out in the Bridges units and monthly Number Corner write-ups. The RtI model is most effective if it rests on a curriculum such as Bridges, which is based on best practices, research-validated models and instructional methods, consistent development of key vocabulary, and an unflagging commitment to access and equity for all students.

2 Use the observational assessments included with each Work Place Guide in the Bridges units to fine-tune instruction during Work Places. The Assessment & Differentiation section on the first page of each Work Place Guide teacher master provides guidance about specific behaviors to watch for and suggests appropriate on-the-spot support or challenge as needed (see example below). The support suggestions, implemented during Work Places, may be just the type of Tier 2 instruction needed to address the needs of your struggling students most of the time.

Unit 6 Module 3 | **Session 5** *1 copy stored for use by the teacher and other adult helpers during Work Place time*

Work Place Guide 6C Volume Bingo

Summary

Players take turns spinning numbers for two dimensions of a rectangular prism and then think of a number for the third dimension that will result in one of the volumes shown on the game board. Players record their numbers and an equation on their record sheets. The first person to cover five spaces in a row vertically, horizontally, or diagonally wins.

Skills & Concepts

- Divide a 2-, 3-, or 4-digit whole number by a 2-digit whole number using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division (5.NBT.6)
- Show that the volume of a right rectangular prism with whole-number edge lengths can be found by multiplying the edge lengths (5.MD.5a)
- Represent the product of three whole numbers as the volume of a right rectangular prism whose edge lengths are equal to those three whole numbers (5.MD.5a)

Materials

Copies	Kit Materials	Classroom Materials
TM T10 Work Place Guide 6C Volume Bingo **TM T11** 6C Volume Bingo Record Sheet **TM T12** 6C Volume Bingo Game Board **TM T13** 6C Volume Bingo Challenge Game Board **SB 241** Work Place Instructions 6C Volume Bingo	• 3 spinner overlays • game markers (each player needs about 20 in a different color than his partner's)	

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that…	Differentiate	Example
Students choose a third factor without checking to see if the product is a volume listed on their board.	SUPPORT Work with students for a few rounds. Talk with them about finding the product of the two factors spun and then identifying multiples of that product.	"I see you have a 4 and a 3. When you multiply those, what do you get? Before you choose a third factor, let's talk about the multiples of 12 and see if any of those are on your game board."
Students choose volumes randomly instead of attempting to find five in a row (not using strategy).	SUPPORT Remind students that they are trying to get five in a row, and for this game they have some control over the number that is "called." Suggest that students look at the numbers near those they have already covered to try to find a multiple of the two factors the spun.	"I see you have markers all over your board. Remember you are trying to get five in a row, so before you choose a volume, let's look around the numbers that are already covered and see if you could cover a space nearby."
Students struggle to divide a volume to find the third factor.	SUPPORT Have students think multiplicatively and show work on a ratio table or on an open array.	"I see you spun a 2 and a 6. What's that? Yes, 12. You want to cover 72, right? OK, let's put this on a ratio table starting with 1 group of 12."
Students easily use strategy while playing to get five in a row on their board.	CHALLENGE Pair students with partners who also play strategically. Invite them to use the Challenge Board and spinner.	"Let's have you two try the Challenge Board and spinner. You will see that the volumes on both the board and spinner are larger, so you will often be multiplying 2-digit numbers."

English-Language Learners Use the following adaptations to support the ELL students in your classroom.

- Ask students to repeat the directions while you play a few rounds in a small group.
- Emphasize the vocabulary terms *factor, multiple,* and *volume* while students are playing.
- Model students' thinking as they work to describe their strategies for multiplying and dividing.

Bridges in Mathematics Grade 5 Teacher Masters **T10** © The Math Learning Center | mathlearningcenter.org

3 Administer the baseline assessment (found in the Number Corner Teacher's Guide) in September. Examine students' work, and score it using the suggestions found in the Number Corner Assessments part of this guide. Use the results to inform your initial thinking about support and intervention. While it may seem a little early in the school year to make hard-and-fast judgments about incoming fifth graders, the baseline assessment serves as an early warning system. You'll want to keep a close eye on students who are unable to perform the featured assessment tasks, as some of these individuals may emerge as candidates for additional services.

4 Administer the checkpoints and unit assessments as they appear in the Bridges units. Assessment instructions, materials, and teacher masters can be found in the Bridges Teachers Guide.

5 Examine, correct, and score students' work, using the class list/scoring guides found in the Bridges Unit Assessment part of this guide. Use of the scoring guides is optional, of course, but the guides will help you and your colleagues, school- or district-wide, score the unit assessments consistently.

6 Use your observations and the results of the assessments to help make decisions about interventions for specific students. The suggestions in the Work Place Guides may be adequate to support those who struggle with one or more skills from time to time. Students who consistently score between 25% and 50% on the Bridges and Number Corner assessments may be targeted for small group Tier 2 instruction, provided during Work Places using games and activities from the Support & Intervention volumes found within the Curriculum section of the Bridges Educator site. Students who consistently score less than 25% on the assessments may need Tier 3 instruction, conducted one-on-one or in a very small group with a tutor or in the resource room.

7 Conduct the Number Corner checkups near the end of each quarter. You will find the instructions, materials, and needed teacher masters in the Number Corner Teachers Guide for October, January, March, and May. These quarterly checkups retest many of the skills covered in the Bridges unit assessments, but may be considered more summative than the unit-end assessments because they reflect a longer span of instruction. Examine, correct, and score students' work, using the class list/scoring guides in the Number Corner Assessments part of this guide.

8 It is well worth your time to meet with other teachers at your grade level, either in your building or in your district, to share, examine, and discuss the results of the Number Corner checkups at or near the end of each quarter. Given that the Number Corner Checkups address a broad set of skills each quarter, the results may provide you and your colleagues with the information you need to make decisions about grouping students needing support as you devise strategies for delivering Tier 2 and Tier 3 instruction to all students in need of intervention, school-wide.

9 The Support & Intervention volumes in the Curriculum section of the Bridges Educator site may be used as a source of Tier 2 instruction and progress monitoring, in or out of the classroom. After targeted students have received Tier 2 instruction for 6–8 weeks, you can pull items from the Comprehensive Growth Assessment to retest specific skills. It is important to note that these volumes focus quite specifically on the critical areas that have been identified for K–5 students—counting and place value; understanding operations; addition, subtraction, multiplication and division fact strategies and fluency; multi-digit computation; word problems; fractions; and decimals.

Support & Intervention

The Support & Intervention volumes include reteaching and practice activities and games; you'll find them in the Curriculum section of the Bridges Educator site.

What About RtI Screeners?

The assessment in Bridges is multi-layered and complex, designed to help teachers monitor students' growth and progress with respect to the entire set of Common Core standards for Grade 5. There are times when you might need something much shorter and faster to administer. There are a number of RtI "screeners" currently available, including some fine products available free online. These are generally one-on-one interviews featuring a few carefully selected items related to key numeracy skills for the grade level. They are quick and easy to conduct, and are sometimes used by teachers at the start of the school year to quickly identify students in need of Tier 2 or Tier 3 instruction. These screeners can be readministered midyear and again at the end of the year as needed to gauge the effects of interventions.

The key difference between RtI screeners and the assessments in Bridges and Number Corner is that screeners address a very limited set of skills, selected for their importance in determining the success of a student in developing the desired level of numeracy for a given grade level.

A Word About the Scoring Guides

In the Bridges Unit Assessments and Number Corner Assessments parts of this guide, you'll find scoring guides for every assessment in the Bridges units (including the work samples) and all the Number Corner assessments. These guides assign a point value to every item on an assessment. If an item involves a level of cognitive demand greater than simple recall, the scoring guide generally gives specific direction about how to assign points. Consider the example below, taken from the scoring guide for the Unit 3 Pre-Assessment.

Item	CCSS	Points Possible
7a–c Explain patterns in the number of zeros in the product, as well patterns in the placement of the decimal point when multiplying by powers of 10. *$24.00, 100, $2,400.00; Responses to 7b and 7c will vary. Examples: Every time you multiply the same number by 10 again, you get another 0 because the answer is 10 times more. The decimal point moves over to the right each time to make room for another place on the whole number side.*	5.NBT.2	**3 pts.** • 1 pt. for filling in the correct values • 1 pt. for observing that the number of zeros in the product increases by 1 each time, and giving a reasonable explanation as to why. • 1 pt. for a reasonable explanation as to why the decimal point shifts one place to the right each time.

Here is another example, taken from the scoring guide for the Unit 2 Pre-Assessment. This is a three-part problem in which students write an equation to represent a multi-step word problem, use estimation to evaluate the reasonableness of an answer given by another student, and solve the problem. It is possible to earn up to 5 points for the three parts combined.

Item	CCSS	Points Possible
10a Choose the best estimate for a story problem that involves adding fractions with unlike denominators. *Choice 2: More than half a mile but less than a whole mile.*	5.NF.2	**1 pt.**
10b Solve the problem. Show work. *⅚ of a mile; work will vary.*	5.NF.2	**2 pts.** • 1 pt. for correct answer • 1 pt. for work that could lead to the correct answer
10c Assess the reasonableness of an answer to the story problem. *No; explanations will vary. Example: ⅖ of a mile is not a reasonable answer because ⅖ is less than ½.*	5.NF.2	**1 pt.** for a sensible explanation as to why ⅖ is not a reasonable answer

Note that a student who is able to select the best estimate for the problem, show work that could lead to the correct answer, and assess the reasonableness of an answer given by another student is able to score 3 out of the 4 points possible, even if he doesn't get the correct answer. Why not award 1 point for the correct answer to the problem and be done with it? Because we're interested in taking a more nuanced look at what the student *can* do. Estimating the results of adding 2 fractions with unlike denominators and then solving the problem is fairly complex; assessing the reasonableness of a solution given by a hypothetical fifth grader adds another layer of complexity. If a student can estimate the results of adding ½ and ⅓, devise a strategy that could lead to the correct answer, and explain why ⅖ is not a reasonable answer, he is working at a grade-appropriate level of understanding, even if he makes an arithmetical error and winds up with the wrong answer. This is not to say that accuracy is unimportant, but the Common Core standards *also* value practices such as making sense of a problem by estimating the results before solving it, modeling with mathematics, and communicating effectively, so these must be taken into account.

Assessment vs. Evaluation

Assessment and evaluation are often confused or taken to mean the same thing, but there is an important distinction between the two. Assessment is the process of gathering information in order to make decisions. Evaluation is a step beyond assessment in that we assign a rank, level, score, or grade to the information that has been collection. Assessment captures the situation as it exists at a particular moment or over a period of time. Evaluation places a judgment on it—adequate, not adequate; enough, not enough; below, at, or above expectation.

The fact that RtI is data-driven requires a move in the direction of evaluation. In working with our colleagues to make instructional decisions that sometimes go beyond the walls of our own classroom, the results of our assessments take on added weight at times. The scoring guides in this assessment guide bear out this line of thinking, in that the points possible for each item are added together, and the total scored by a student is assigned a value: meeting standard, approaching standard, strategic (Tier 2), or intensive (Tier 3). Here are examples taken from two of the scoring guides in the Bridges Unit Assessments part of this guide. The first is from the scoring guide for the Unit 3 Pre-Assessment. This pre-assessment, like the others that appear at the beginning of each unit, is formative, designed to help teachers make instructional decisions (plan to slow down or compact the rate of instruction; reteach a certain skill or concept to the whole class before starting the unit; anticipate pulling a small group during Work Places to provide extra support with a particular skill; and so on) based on students' responses.

TOTAL SCORE/LEVEL OF PROFICIENCY* 38 pts.

10–38 points (25%–100%): Working at Tier 1 or Tier 2 Level
9 points or fewer (24% or less): May need Tier 3 support to succeed with the work in Unit 3

The example below is taken from the Unit 3 Post-Assessment, administered at the end of the unit. This assessment, like the rest of the unit-end assessments, is more summative in nature, basically serving to evaluate how well each student did with skills and concepts presented over the course of the unit.

TOTAL SCORE/LEVEL OF PROFICIENCY* 38 pts.

* Meeting Standard	29–38 points (75%–100% correct)
Approaching Standard	19–28 points (50–74% correct)
Strategic	10–18 points (25–49% correct)
Intensive	9 points or fewer (24% or less correct)

The cut scores and the designations assigned to each range are designed to help teachers identify students in need of Tier 2 or Tier 3 instruction as well as students who are approaching or meeting standard. This ranking system is particularly useful in districts with standards-based report cards, where the marks shared with families have to do with whether or not their children are meeting nationally established standards.

Section 6

Reporting to Families

Research has shown that the home environment has a profound impact on the academic achievement of our students. Its relationship to student achievement is much stronger than that of household income, parent's occupations, or parents' education. Ongoing communication is critical to the success of the parent-teacher and family-school relationship. With the proper resources and information, parents, families, and the community can become a teacher's greatest asset and support system.

In contrast to years past, when grade level standards varied from one state, one district, or even one school to another, most states have adopted the common, coherent, rigorous, and focused goals set by the Common Core State Standard Initiative. It is safe to anticipate that we will have support from a variety of organizations, ranging all the way from the federal and state governments to the National PTA, in communicating grade-level expectations to families. In fact, as of this writing, the PTA has made available a set of guides that explain the Common Core State Standards at each grade level and offer tips about how families can support their children's mathematical development at home. Such resources are likely to be increasingly available, many online. Links to the PTA *Parents' Guide to Student Success* and other resources for families, including unit overviews for each grade level, can be found on the Bridges Educator site.

Even though most states have adopted the Common Core Standards, the pacing of instruction and assessment will continue to vary from one district to another, along with the methods, models, and strategies for helping students master the national standards. It will still be incumbent upon teachers to communicate with families about how the standards are being taught and assessed. One of the more powerful ways we can accomplish this is through conferencing and writing reports. Although your district probably determines the form and content of your report cards, you may be free to supplement with written comments, checklists and the like. We have provided quarterly Math Progress Reports to help you report students' progress to families in greater detail. Please note that the skills and concepts on these reports follow the sequence of instruction and assessment in Bridges and have been framed in family-friendly language. Also, those standards associated with the Critical Areas of Focus for Grade 5 may appear on more than one of the reports.

In addition to marking the Progress Report, there is room to write a note about each student's use of the CCSS Mathematical Practices, along with observations about any special strengths or weaknesses. During conferences, you can provide even more information for families by sharing samples of students' work, including notable responses to items on unit and Number Corner assessments.

Having clearly defined goals helps families and teachers work together to ensure that students succeed. Standards help parents and teachers know when students need extra assistance or when they need to be challenged even more.

» National PTA

Grade 5 Math Progress Report: First Quarter

Assessment Schedule: September through late October/early November

Note Students are expected to have mastered only the starred skills on the chart below. The other skills on the list reflect our work this quarter, but full mastery is not expected until later in the school year.

CCSS	Needing	Meeting	Exceeding
3.OA.7*		Knows multiplication facts through 10 × 10, and can easily solve related division facts through 100 ÷ 10.	
5.OA.1*		Writes and evaluates numerical expressions with parentheses, e.g., 25 × (10 – 4). Understands that parentheses indicate the order in which operations are to be carried out.	
5.OA.2*		Writes expressions to record calculations; interprets expressions without evaluating them. For example, can tell that the expression 280 × 5 is equal to the expression 140 × 10 because one factor has been halved, while the other has been doubled.	
5.NBT.6		Uses models and strategies to divide 2- and 3-digit numbers by 2-digit numbers, with and without remainders. (Students are not expected to use the standard long division algorithm until sixth grade.)	
5.NF.1*		Adds and subtracts fractions with unlike denominators, e.g., ⅔ + ½, by rewriting the fractions so they have the same denominator. For example, rewrites ⅔ + ½ as ⅚ + ⅜ to get a total of ⅞ or 1 ⅛.	
5.NF.2*		Estimates the answers to story problems that involve adding and subtracting fractions with unlike denominators, solves the problems, and assesses the reasonableness of answers.	
5.NF.3		Understands that a fraction such as ½ means 1 ÷ 2 and is actually the answer to the division combination, because 1 divided by 2 is ½.	
5.NF.4a		Uses models and strategies to multiply a whole number by a fraction, e.g., 36 × ¼ = 9.	
5.MD.3a*		Understands that volume has to do with the amount of space taken up by a three-dimensional object, and is measured in cubic units.	
5.MD.3b*		Understands that a solid figure, such as a rectangular prism, which can be packed using *n* unit cubes has a volume of *n* cubic units.	
5.MD.4*		Measures the volume of a solid figure by counting the cubes it takes to fill it, with no gaps or overlaps.	
5.MD.5a*		Finds the volume of a rectangular prism by packing it with unit cubes, and shows that the result is the same as would be found by multiplying the length times the width times the height of the prism.	

Comments

Grade 5 Math Progress Report: Second Quarter

Assessment Schedule: November–January

Note Students are expected to have mastered only the starred skills on the chart below. The other skills on the list reflect our work this quarter, but full mastery is not expected until later in the school year.

CCSS	Needing	Meeting	Exceeding
5.NBT.1		Understands that in a multi-digit number such as 4,587,934 each digit represents 10 times what it represents in the place to its right, and one-tenth what it represents in the place to its left.	
5.NBT.2		Explains patterns in the number of zeros in the answer when multiplying by powers of 10, e.g., 10, 100, 1000, and so on.	
5.NBT.2		Explains patterns in the placement of the decimal point when multiplying or dividing by powers of 10.	
5.NBT.3a*		Reads and writes decimals to thousandths using numbers, words, and expanded notation. For example, writes 25.129 as twenty-five and one hundred twenty-nine thousandths, and also as $(2 \times 10) + (5 \times 1) + (1 \times \frac{1}{10}) + (2 \times \frac{1}{100}) + (9 \times \frac{1}{1000})$.	
5.NBT.3b*		Compares pairs of decimal numbers and uses >, =, and < symbols to record the comparisons.	
5.NBT.4*		Rounds decimals to the nearest ten, one, tenth, or hundredth.	
5.NBT.5*		Uses the standard algorithm to multiply multi-digit whole numbers.	
5.NBT.6*		Uses models and strategies to divide 2-, 3-, or 4-digit numbers by 2-digit numbers, with and without remainders. (Students are not expected to use the standard long division algorithm until sixth grade.)	
5.NBT.7*		Uses models and strategies to add and subtract decimals to hundredths.	
5.NBT.7		Uses models and strategies to multiply and divide decimals to hundredths.	
5.NF.4a		Multiplies a whole number by a fraction, e.g., $36 \times \frac{1}{4} = 9$.	
5.MD.1		Converts among different-sized measurement units within a given measurement system (e.g., centimeters, meters, and kilometers), and solves related word problems.	

Comments

Grade 5 Math Progress Report: Third Quarter

Assessment Schedule: February–March

Note Students are expected to have mastered only the starred skills on the chart below. The other skills on the list reflect our work this quarter, but full mastery is not expected until later in the school year. Skills marked with two stars were to have been mastered earlier in the school year, but our work this quarter has featured opportunities to review, extend and apply these skills in new situations.

CCSS	Needing	Meeting	Exceeding
5.OA.3*		Generates two number patterns given two different rules, and graphs both of them.	
5.NBT.6**		Uses models and strategies to divide 2-, 3-, or 4-digit numbers by 2-digit numbers, with and without remainders. (Students are not expected to use the standard long division algorithm until sixth grade.)	
5.NF.1**		Adds and subtracts fractions with unlike denominators.	
5.NF.3*		Understands that a fraction such as ½ means 1 ÷ 2 and is actually the answer to the division combination, because 1 divided by 2 is ½.	
5.NF.4a*		Uses models and strategies to multiply a whole number by a fraction, e.g., 36 × ¼ = 9, and a fraction by another fraction, e.g., ¾ × ⅚.	
5.NF.4b*		Multiplies fractional side lengths to find areas of rectangles, and represents fraction by fraction multiplication as rectangular areas.	
5.NF.5b*		Can explain why a given number multiplied by a fraction less than 1 (e.g., 4 × ⅖) results in a product smaller than the given number, and why a given number multiplied by a fraction greater than 1 (e.g., 4 × ⅚) results in a product greater than the given number.	
5.NF.6*		Solves story problems involving multiplication of fractions and mixed numbers.	
5.NF.7a*		Uses models and strategies to divide a unit fraction by a whole number, e.g., ¼ ÷ 3.	
5.NF.7b*		Uses models and strategies to divide a whole number by a unit fraction, e.g., 6 ÷ ½.	
5.NF.7c*		Solves story problems that involve dividing a unit fraction by a whole number and vice versa.	
5.MD.1*		Converts among different-sized measurement units within a given measurement system and solves related word problems.	
5.MD.2*		Makes a line plot to a data set of measurements in fractions of a unit (½, ¼, ⅛), and solves related problems.	
5.MD.5a**		Finds the volume of a rectangular prism by packing it with unit cubes, and shows that the result is the same as would be found by multiplying the length times the width times the height of the prism.	
5.MD.5b*		Uses the formulas $V = l \times w \times h$ and $V = b \times h$ to find the volume of rectangular prisms.	
5.MD.5c*		Finds the volume of a solid figure composed of two or more non-overlapping rectangular prisms by calculating the volume of each prism and adding the results.	
5.G.1*		Locates a point on a coordinate plane based on its ordered pair of coordinates. Identifies the *x*- and *y*-coordinates of a given point in a coordinate plane.	
5.G.2*		Graphs points in the first quadrant of the coordinate plane to represent a problem. Describes the meaning of the values of coordinate points based on the context of a problem.	
5.G.3*		Understands that the attributes of a category of two-dimensional shapes belong to all the subcategories of that category. For example, all quadrilaterals have 4 sides. A rectangle is a quadrilateral, so it has 4 sides.	
5.G.4*		Classifies two-dimensional shapes on the basis of their properties.	

Comments

Grade 5 Math Progress Report: Fourth Quarter

Assessment Schedule: April–May

Note Students are expected to have mastered only the starred skills on the chart below. Skills marked with two stars were to have been mastered earlier in the school year, but our work this quarter has featured opportunities to review, extend and apply these skills in new situations.

CCSS	Needing	Meeting	Exceeding
5.NBT.1*		Understands that in a multi-digit number such as 4,587,934 each digit represents ten times what it represents in the place to its right, and one-tenth what it represents in the place to its left.	
5.NBT.2*		Explains patterns in the number of zeros in the answer when multiplying by powers of 10, e.g., 10, 100, 1,000, and so on.	
5.NBT.2*		Explains patterns in the placement of the decimal point when multiplying or dividing by powers of 10.	
5.NBT.5**		Uses the standard algorithm to multiply multi-digit whole numbers.	
5.NBT.6**		Uses models and strategies to divide 2-, 3-, or 4-digit numbers by 2-digit numbers, with and without remainders. (Students are not expected to use the standard long division algorithm until sixth grade.)	
5.NBT.7**		Uses models and strategies to add and subtract decimals to hundredths.	
5.NBT.7*		Uses models and strategies to multiply and divide decimals to hundredths.	
5.NF.3**		Understands that a fraction such as ½ means 1 ÷ 2 and is actually the answer to the division combination, because 1 divided by 2 is ½.	
5.NF.4a**		Uses models and strategies to multiply a whole number by a fraction, e.g., 36 × ¼ = 9, and a fraction by another fraction, e.g., ¾ × ⅝.	
5.NF.4b**		Multiplies fractional side lengths to find areas of rectangles, and represents fraction by fraction multiplication as rectangular areas.	
5.NF.6**		Solves story problems involving multiplication of fractions and mixed numbers.	
5.NF.7a**		Uses models and strategies to divide a unit fraction by a whole number, e.g., ¼ ÷ 3.	
5.NF.7b**		Uses models and strategies to divide a whole number by a unit fraction, e.g., 6 ÷ ½.	
5.NF.7c**		Solves story problems that involve dividing a unit fraction by a whole number and vice versa.	
5.MD.1**		Converts among different-sized measurement units within a given measurement system and solves related word problems.	
5.MD.5a**		Finds the volume of a rectangular prism by packing it with unit cubes, and shows that the result is the same as would be found by multiplying the length times the width times the height of the prism.	
5.MD.5b**		Uses the formulas $V = l \times w \times h$ and $V = b \times h$ to find the volume of rectangular prisms.	
5.G.2**		Graphs points in the first quadrant of the coordinate plane to represent a problem. Describes the meaning of the values of coordinate points based on the context of a problem.	

Comments