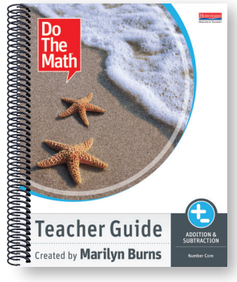
DO THE MATH TEACHER GUIDE SAMPLER

ADDITION & SUBTRACTION, NUMBER CORE

This Sampler includes select pages from the Addition & Subtraction, Number Core Teacher Guide. You'll see a sample of the:

- Instructional Principals
- Letter from Marilyn Burns
- Planner
- Lessons
- Annotated *WorkSpace*



Heinemann
Dedicated to Teachers™

Do The Math®

Created by Marilyn Burns

Teacher Guide

ADDITION & SUBTRACTION

Number Core

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Help At-Risk and Struggling Students
Succeed in Math

Research shows that students with diverse needs succeed in learning mathematics through explicit, intentional teaching based on proven instructional strategies.

TEACHING FOR UNDERSTANDING

Students benefit from instruction based on teaching for understanding.

Step-by-step lessons help students develop understanding, learn mathematical skills, see relationships, and make connections.

- Learning experiences link concepts and skills to their mathematical representations and language.
- Students use concrete and pictorial models to build a strong foundation in key mathematical concepts, operations, and strategies.

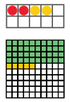
SCAFFOLDED CONTENT

Scaffolding of the content makes the mathematics more accessible to students.

Do The Math focuses on key content in mathematics so that students are not overwhelmed with extraneous material.

- The content is organized into manageable chunks.
- The lessons are explicit about the relationships among these chunks.
- The instruction is carefully sequenced to help students build a solid foundation of understanding.

ADDITION & SUBTRACTION MODELS

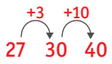


Ten-frames and **hundred-frames** build students' understanding of place value.

Counters and **tiles** make sums of 10 and represent the addition and subtraction of quantities.

Spinners and **number cubes** identify random digits in subtraction games.

Connecting cubes represent joining problems.



Open number lines help students flexibly add and subtract using benchmark numbers.

MULTIPLE STRATEGIES

Exploring different strategies for developing concepts and skills builds students' reasoning.

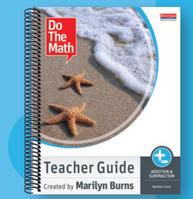
The lessons engage students with each concept and skill in several ways, deepening their mathematics knowledge.

- Hands-on **manipulatives** give students concrete experiences with abstract ideas.
- The **digital mTools** give students the opportunity to translate concrete manipulatives to pictorial representations.
- **Classroom** and **digital partner games** offer engaging experiences that reinforce mathematical understandings and skills.
- **Children's literature** provides a springboard for instruction.
- Contexts make abstract mathematical ideas accessible.

MATHEMATICAL THINKING

These standards help develop mathematical expertise and habits of mind in all students.

- Students **persevere and solve problems** and look for entry points to solutions.
- Students **reason abstractly** to make sense of quantities and their relationships in problem situations.
- Students use stated assumptions, definitions, and previously established results to **construct viable arguments**.
- Students **model with mathematics** to solve real-world and mathematical problems.
- Students apply **mathematical** and **practical tools** strategically when solving problems.
- Students **attend to precision**, using mathematical language to communicate clearly and accurately.
- Students look closely to **discern patterns** or **structure** when solving problems.
- Students **use repeated reasoning** to identify general methods and shortcuts.



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Help Students Build Their Mathematical Reasoning

CLASSROOM ROUTINES

Routines such as "think, pair, share" promote engagement and deepen student understanding.

THINK
Students collect their thoughts individually.

PAIR
Students discuss with a partner.

SHARE
Students report ideas to the whole group. Expressing ideas and hearing other perspectives help students clarify their thinking.

- The listening and speaking that occur during "think, pair, share" are especially valuable for English language learners.
- Teachers can pair English language learners with other students who speak the same first language to allow them to discuss concepts.
- Teachers can also pair a student with early English skills and a student with strong English skills to encourage language development.

INDEPENDENT STUDENT WORK

Assignments provide students with opportunities to practice, strengthen, and extend their learning.

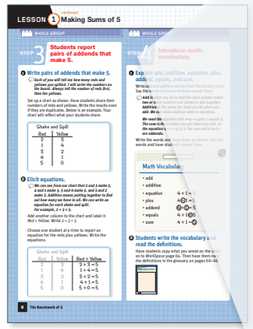
- ***WorkSpace*® assignments** are carefully constructed to motivate students and maximize their success through games, assignments for reinforcement, and problem-solving situations.
- The **digital experience** gives students the flexibility to explore mathematical tools and games within and outside the classroom.

VOCABULARY AND LANGUAGE

Explicit vocabulary instruction helps students communicate effectively about the math they are learning.

Vocabulary is introduced after students experience concepts. Vocabulary lessons follow a consistent routine—the teacher writes the vocabulary on the *Math Vocabulary* chart and provides an example; students see, hear, say, and write it; and the vocabulary is then incorporated throughout the lessons to support students' learning.

- Key **mathematical** and **academic vocabulary** is highlighted at the start of each lesson, and **Spanish translations** are provided.
- A **glossary** in the *WorkSpace*® provides students with a reference for definitions.


LESSON 1 Making Sums of 5

STEP 3 Students report pairs of addends that make 5.

STEP 4 Introduce math vocabulary.

Math Vocabulary

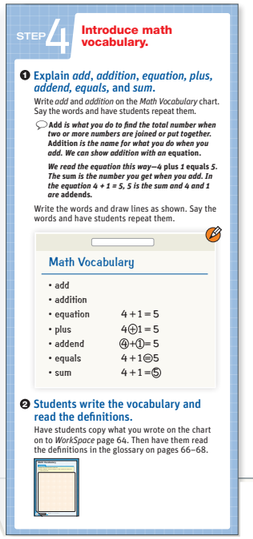
- add
- addition
- equation 4 + 1 = 5
- plus 4 ⊕ 1 = 5
- addend ④ + ① = 5
- equals 4 + 1 ⊜ 5
- sum 4 + 1 = ⑤

ASSESSMENT AND DIFFERENTIATION

Ongoing assessment is built into the program to help teachers meet individual student needs.

During lessons, teachers observe students working in the whole group, with partners, and independently.

- Specific guidance for how to promote understanding and **address student misconceptions** is integrated into all lessons.
- Suggestions for **differentiating instruction** are included after every "Assessing Student Understanding" lesson, both for students who need additional help and those who are ready for a challenge.


STEP 4 Introduce math vocabulary.

❶ Explain *add*, *addition*, *equation*, *plus*, *addend*, *equals*, and *sum*.

Write *add* and *addition* on the *Math Vocabulary* chart. Say the words and have students repeat them.

Add is what you do to find the total number when two or more numbers are joined or put together. Addition is the name for what you do when you add. We can show addition with an **equation**.

*We read the equation this way—***4 plus 1 equals 5***. The sum is the number you get when you add. In the equation 4 + 1 = 5, 5 is the sum and 4 and 1 are* **addends**.

Write the words and draw lines as shown. Say the words and have students repeat them.

Math Vocabulary

- add
- addition
- equation 4 + 1 = 5
- plus 4 ⊕ 1 = 5
- addend ④ + ① = 5
- equals 4 + 1 ⊜ 5
- sum 4 + 1 = ⑤

❷ Students write the vocabulary and read the definitions.

Have students copy what you wrote on the chart on to *WorkSpace* page 64. Then have them read the definitions in the glossary on pages 66–68.

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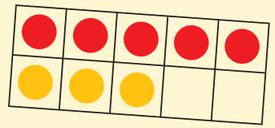
FROM MARILYN BURNS

Dear Colleague,

This module has been specifically designed for students who lack a foundation in the very basics. The number 5 is an important benchmark in our base-ten number system, and the first two lessons ease students into the module with a focus on pairs of addends that make 5.

Students use two-color counters as a visual tool. They engage in two activities—*Shake and Spill* and *Race to the Top*. A variety of games and activities like these are woven throughout the module to motivate students' interest and support their learning. In these first two activities, students spill five counters to generate pairs of addends that make 5 and then record the different combinations.

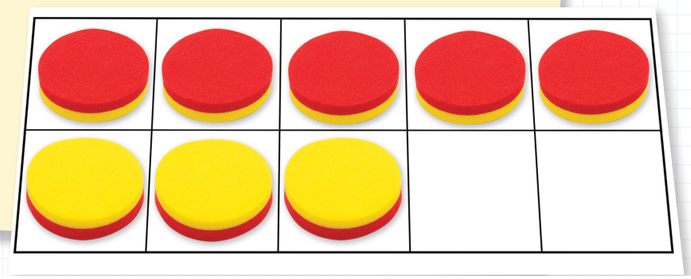
Students are then introduced to another visual tool—the ten-frame. The ten-frame is ideal for providing a structure that helps students use the benchmark number of 5 to build numbers and find sums to 10. The strategy of making a 5 is useful for building students' number sense and skill with sums to 10.



> "The number 5 is an important benchmark in our base-ten number system."

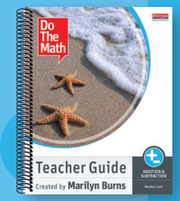
Students use the ten-frames along with the two-color counters for a new activity—*Roll and Add*—which gives them practice figuring sums to 10. Students also revisit *Shake and Spill* and *Race to the Top*, now applying these activities to numbers greater than 5. They also investigate patterns in pairs of addends for sums to 10.

Marilyn Burns



In Lessons 1–5, students...

- Use the benchmark of 5 to represent sums of 6 to 9.
- Identify pairs of addends with sums to 9.
- Communicate ideas with key math vocabulary: *add, addend, addition, equals, equation, plus,* and *sum.*



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PLANNER

The Benchmark of 5

See pages 14-17 for the full lesson

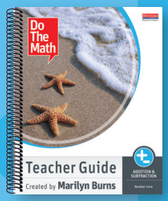
See pages 22-24 for the full lesson

	LESSON 1	LESSON 2	LESSON 3	LESSON 4	LESSON 5
		Game	Game		Progress Monitoring
	Making Sums of 5 Students use two-color counters to generate pairs of addends that make 5 and then write them as equations with addition.	**Finding Addend Pairs That Make 5** Students find and list all pairs of addends that make 5 and then play a game to practice making 5.	**Using 5 as a Benchmark** Students use a ten-frame and the benchmark of 5 to build numbers and find sums to 10.	**Using the Benchmark of 5 for Sums of 6 to 10** Students use the benchmark of 5 to represent sums of 6 to 10.	**Assessing Student Understanding** Students demonstrate understanding of the objectives of Lessons 1–4 by completing a *WorkSpace* page independently.
OBJECTIVES	• Identify pairs of addends that make 5.	• Identify all possible pairs of addends that make 5. • Given a number, figure how many more to make 5.	• Identify numbers to 10 using the benchmark of 5.	• Use the benchmark of 5 to represent sums of 6 to 10.	• Use the benchmark of 5 to represent sums of 6 to 10. • Identify pairs of addends with sums to 9.
PURPOSE	Using **hands-on manipulatives** to represent various pairs of addends with the same sum helps students connect concrete experiences with the more abstract experience of writing equations.	Playing a game in pairs to identify pairs of addends that make 5 promotes **communication** and **mathematical language skills** among students.	The **visual representation** of counters on a ten-frame focuses students on the benchmarks of 5 and 10, thus enabling them to compose, decompose, and add numbers flexibly.	Using **manipulatives**, such as ten-frames, helps students use the benchmark of 5 to name numbers without counting by ones.	Assessing with familiar **visual models** and **symbolic representations** allows students to show their understanding without having to approach the material in an unfamiliar format.
KEY MATH VOCABULARY	• add **NEW** • addend **NEW** • addition **NEW** • equals **NEW** • equation **NEW** • plus **NEW** • sum **NEW**	• add • addend • addition • equals • equation • plus • sum	• add • addend • addition • equals • equation • plus • sum	• add • addend • addition • equals • equation • plus • sum	• add • addend • addition • equals • equation • plus • sum
MATERIALS Physical manipulatives are also available as digital tools for teachers and students. mTools Digital Games	• *WorkSpace* pages 2, 64, and 66–68 • Two-color counters • Plastic cup • Chart paper	• *WorkSpace* pages 2–5 • Two-color counters • Plastic cup • *Race to the Top*	• *WorkSpace* pages 6–7 • Ten-frame • Two-color counters • Yellow crayon • *Race to the Top With 6 Counters*	• *WorkSpace* page 8 • Ten-frame • Two-color counters • Red number cube • Yellow number cube • *Community News*	• *WorkSpace* pages 9–10 • Ten-frame • Two-color counters

mTools
In these lessons, you will use:
- Two-color counters
- Number cubes
- Plastic cup
- Ten-frames

Professional Learning Online
To support teaching these lessons:
- View "Teaching Math Vocabulary."
- Read "Language of Math."

Read the **Introduction** to **Addition & Subtraction**.



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LESSON 3 Using 5 as a Benchmark

Previous Lesson Students play a game finding pairs of addends that make 5.

Lesson 3 Students use a ten-frame and the benchmark of 5 to build numbers and find sums to 10.

Next Lesson Students use the benchmark of 5 to represent sums of 6 to 10.

Summary

Students use a ten-frame and the benchmark of 5 to build numbers and find sums to 10.

Objectives

- Identify numbers to 10 using the benchmark of 5.

Materials

- *WorkSpace* pages 6–7
- Ten-frame
- Two-color counters
- Yellow crayon
- *Race to the Top With 6 Counters*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
add	sumar
addend	sumando
addition	*adición*
equals	*es igual a*
equation	*ecuación*
plus	más
sum	*suma*

Academic Vocabulary

ENGLISH	SPANISH
row	fila

Cognates are shown in italics.

WHOLE GROUP

STEP 1 Introduce the ten-frame.

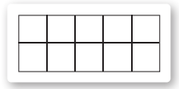
❶ Introduce the lesson.

We have added numbers to make 5. Today we will build numbers to 10.

❷ Introduce the ten-frame.

Show students a ten-frame.

This is called a ten-frame.



Slide your finger across each row as you ask the following questions.

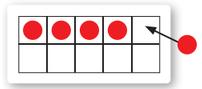
How many rows are there in this frame? (2)

How many boxes are in each row? (5)

How many boxes are there in all? (10)

I will show you how we place counters on the ten-frame.

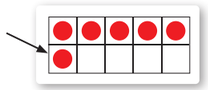
Place 5 two-color counters, one at a time, red side up, on the ten-frame. Start at the top row with the box on the far left. Have students count with you as you place each counter in the top row—1, 2, 3, 4, 5.



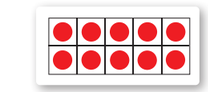
When the top row of the ten-frame is full, you know that there are 5 counters, so you don't have to count them one-by-one.

❸ Continue to place counters on the ten-frame.

I start the next row by placing a red counter at the left.

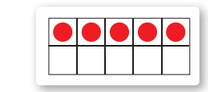


Continue placing the counters red side up one at a time from left to right until the ten-frame is filled. Have students count with you as you place each counter—6, 7, 8, 9, 10.



How many counters are on the ten-frame when it's full? (10)

Remove the counters from the bottom row.



How many counters are there now? (5)

Remember, if one row is full, we know there are 5 counters. If both rows are full, we know there are 10. We don't have to count them one-by-one.

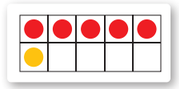
WHOLE GROUP

STEP 2 Guide students to build on from 5.

❶ Use the benchmark of 5 to build numbers on the ten-frame.

I will place one more counter on the ten-frame.

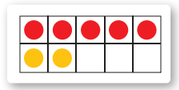
Place one counter yellow side up on the ten-frame.



Sweep your hand across the top row as you say *five* and then point to the one yellow as you say *six*.

Start with 5 and count on one to get 6. I don't have to count the 5 because I know there are 5 counters in the top row.

Place another counter yellow side up on the ten-frame.



How many counters are on the ten-frame now? (7)

Yes, there are 7 counters. I start with 5 and count on two more to get 7. 5, 6, 7.

Continue this process for 8 and 9 counters. Be sure to count with students, sweeping your hand across the top row and then pointing as you count on: *5, 6, 7, 8* and *5, 6, 7, 8, 9*.

Place the tenth counter on the ten-frame.

How many counters are on the ten-frame now? (10)

Remember we don't need to count one-by-one when the ten-frame is full.

CONTINUE

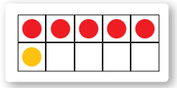
LESSON 3 continued Using 5 as a Benchmark

WHOLE GROUP

STEP 3 Demonstrate writing equations.

❶ Model writing an equation using the benchmark of 5.

Remove the counters from the bottom row of the ten-frame. Place 1 counter yellow side up on the bottom row of the ten-frame.



I can write an addition equation for the 6 counters. I can see that 5 plus 1 equals 6.

Write the equation on the board.

$5 + 1 = 6$

Place another counter yellow side up on the ten-frame.

What equation can I write for the total number of counters? (5 + 2 = 7)

Continue adding counters one at a time and yellow side up to model the equations 5 + 3 = 8 and 5 + 4 = 9. Write the equations on the board as shown.

$5 + 1 = 6$
$5 + 2 = 7$
$5 + 3 = 8$
$5 + 4 = 9$

WHOLE GROUP

STEP 4 Demonstrate using the benchmark of 5 for sums of 6.

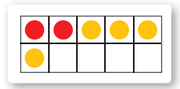
❶ Model how to use the benchmark of 5 to find sums.

Now we are going to look at how 5 can help us solve addition problems. For example, 2 plus 4.

Place 2 counters red side up and 4 counters yellow side up on a ten-frame.

First, I put two reds on the ten-frame. Then, I put on four yellows. This shows the addition problem 2 + 4.

What equation can we write? (2 + 4 = 6)



Erase the board and write the equation.

$2 + 4 = 6$

We can also look at the total 6 in a different way. We know that there are 5 in the first row and 1 in the second row.

I can write 5 + 1 = 6.

Write the second equation on the board.

$2 + 4 = 6$
$5 + 1 = 6$

We can see two ways to make 6. If we look at the colors we see 2 + 4, and if we look at the rows we see 5 + 1.

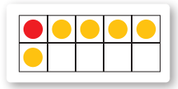
WHOLE GROUP

STEP 5 Students write equations.

❶ Guide students through a second example.

Now let's do this for 1 + 5. Place 1 red counter on the ten-frame. Now place 5 yellows on the ten-frame.

Check to be sure students do this correctly.



What equation can we write if we look at the colors? (1 + 5 = 6) *What equation can we write if we look at the rows?* (5 + 1 = 6)

Write the equations on the board.

$2 + 4 = 6$
$5 + 1 = 6$
$1 + 5 = 6$
$5 + 1 = 6$

❷ Partners state two equations.

Now empty the ten-frame and place 3 reds and 3 yellows on it. What equations can you write?

Have students think, pair, share. Model 3 + 3 with counters on a ten-frame. Choose students to state the equations. Write the equations on the board.

$2 + 4 = 6$
$5 + 1 = 6$
$1 + 5 = 6$
$5 + 1 = 6$
$3 + 3 = 6$
$5 + 1 = 6$

INDIVIDUALS

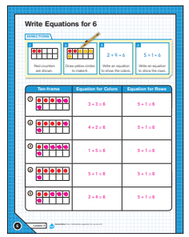
STEP 6 Students write two equations for sums of 6.

❶ Explain the directions for *WorkSpace* page 6.

Have students turn to *WorkSpace* page 6. Explain the directions. Each student will need a yellow crayon to draw counters in the ten-frames to make 6.

To make a total of 6, you will use a yellow crayon to draw counters in the boxes on the ten-frames. Then you will write two equations for each ten-frame.

❷ Students complete *WorkSpace* page 6.

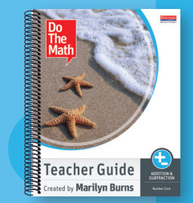


When you finish page 6, you may play **Race to the Top With 6** counters *on page 7.*

SUPPORTING INSTRUCTION

Think, pair, share is a routine that will be used throughout this module. Explain the routine to students. They should think first and then talk with their partners, taking turns listening and speaking, and finally discuss what they will say when they are called on to share with the whole group. Having students talk in pairs provides them with a "safe" way to share ideas that they may not be quite sure of, think of words to articulate their ideas, brainstorm, and practice what they will say when they share with the larger group.

STOP



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LESSON 5 Assessing Student Understanding

Previous Lesson Students use the benchmark of 5 to represent sums of 6 to 10.

Lesson 5 Students demonstrate understanding of the objectives of Lessons 1–4.

Next Lesson Students write equations for problems with a sum of 10 and then identify the missing addends.

Summary

Students demonstrate understanding of the objectives of Lessons 1–4 by completing a *WorkSpace* page independently.

Objectives

- Use the benchmark of 5 to represent sums of 6 to 10.
- Identify pairs of addends with sums to 9.

Materials

- *WorkSpace* pages 9–10
- Ten-frame
- Two-color counters

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
add	sumar
addend	sumando
addition	*adición*
equals	*es igual a*
equation	*ecuación*
plus	más
sum	*suma*

Academic Vocabulary

ENGLISH	SPANISH
row	fila

Cognates are shown in italics.

WHOLE GROUP

STEP 1 Students use the benchmark of 5 to add.

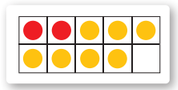
❶ Introduce the lesson.

Today, we'll write two equations for sums of 7, 8, and 9. Then you will show me how much you know about using 5 to help you add numbers with sums to 9. When you have finished, if you have time, you can play* Shake and Spill *for 7, 8, and 9 counters.

❷ Write two equations for a sum of 9.

First let's add 2 and 7. On your ten-frame, place 2 reds and then 7 yellows.

Check to be sure students do this correctly.



If we look at the colors, we see the addition problem 2 + 7. If we look at the rows, we see the addition problem 5 + 4. Use the five counters in the first row to help you find the sum of 2 + 7. (9)

We can write two equations. Looking at the colors, we write 2 + 7 = 9. Looking at the rows, we write 5 + 4 = 9.

Write the equations on the board.

$2 + 7 = 9$
$5 + 4 = 9$

Point to each equation as you say:

Both 2 + 7 and 5 + 4 are equal to 9.

WHOLE GROUP

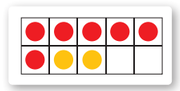
STEP 2 Students use the benchmark of 5 to add.

❶ Write two equations for a sum of 8.

Write *6 + 2* on the board.

$2 + 7 = 9$
$5 + 4 = 9$
$6 + 2$

Place counters on your ten-frame to show this addition problem.



Use the first row of 5 to help you figure out the answer. What did you get? (8) ***What equations can you write?*** (6 + 2 = 8 and 5 + 3 = 8)

Write the equations on the board.

$2 + 7 = 9$
$5 + 4 = 9$
$6 + 2 = 8$
$5 + 3 = 8$

SUPPORTING INSTRUCTION

Since this is the first written assessment, explain to students that the purpose of the assessment is to let you know what they have learned and what more they need to learn. Explain that, although we usually encourage them to work together, for the assessments they will work by themselves without conferring with a partner.

INDIVIDUALS

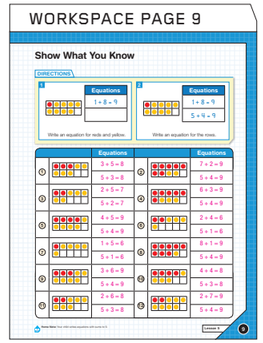
STEP 3 Students complete an assessment.

❶ Explain the directions for *WorkSpace* page 9.

Have students turn to *WorkSpace* page 9. Explain the directions.

Usually you work with a partner, but for this page you'll work by yourself so that I know what you've learned and what you still need to learn.

❷ Students complete *WorkSpace* page 9.



When you finish page 9, you may complete* Shake and Spill *with 7, 8, or 9 counters. Use* WorkSpace *page 10 to write your equations.

SUPPORTING INSTRUCTION

Give students as much time as they need to complete the assessment page. Some students may want to rush through the assessment so that they can play the game, especially if they see others playing. Assure students that they will get some time in the following week to play the game if they don't get to do it today.

AFTER THE LESSON

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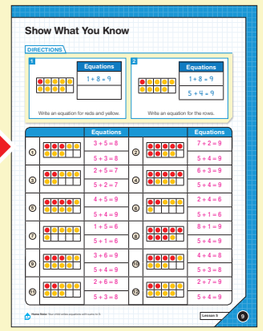
ASSESSMENT **Progress Monitoring**

Objectives
- Use the benchmark of 5 to represent sums of 6 to 9.
- Identify pairs of addends with sums to 9.
- Communicate ideas with key math vocabulary: *add, addend, addition, equals, equation, plus,* and *sum.*

Assess

Use the annotated page to correct *WorkSpace* page 9.


Show What You Know

DIRECTIONS

1 Write an equation for reds and yellows.

Equations
1 + 8 = 9

2 Write an equation for the rows.

Equations
1 + 8 = 9
5 + 4 = 9

	Equations		Equations
①	3 + 5 = 8 5 + 3 = 8	②	7 + 2 = 9 5 + 4 = 9
③	2 + 5 = 7 5 + 2 = 7	④	6 + 3 = 9 5 + 4 = 9
⑤	4 + 5 = 9 5 + 4 = 9	⑥	2 + 4 = 6 5 + 1 = 6
⑦	1 + 5 = 6 5 + 1 = 6	⑧	8 + 1 = 9 5 + 4 = 9
⑨	3 + 6 = 9 5 + 4 = 9	⑩	4 + 4 = 8 5 + 3 = 8
⑪	2 + 6 = 8 5 + 3 = 8	⑫	2 + 7 = 9 5 + 4 = 9

Home Note: Your child writes equations with sums to 9.

Lesson 5 9

See page 9 to view the full version

Note the progress of each student in the appropriate rows of the tracking chart on page 145.

Evaluating Your Students After the First Assessment

You may find that a student is not successful after these five lessons are assessed. Use the Interview Assessment questions found on page 143 to evaluate whether the student will need additional guidance before moving on to Lesson 6.

Differentiating Instruction

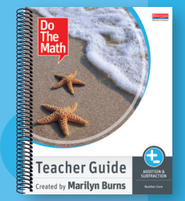
Although the lessons are carefully scaffolded and paced at a rate to give students a chance for optimal learning, there will be instances when students are still struggling and need extra support. Also, there will be instances when students would benefit from additional challenges or practice. Try the teaching ideas below.

For Students Who Need More Support

- If students count all the counters on a ten-frame, one by one, to get the answer, then model how to count on from 5.
  - Sweep your finger above the top row of 5 counters in the ten-frame.
  - Count on the remaining counters, one by one, to get the sum.
  - Have students repeat with other numbers of counters on the ten-frame.
- Complete the *Shake and Spill* activity with students.
  - Place counters correctly on the ten-frame.
  - Determine the sum of the benchmark of 5.
  - Write addition equations.

For Students Ready for a Challenge

- Have students play *Shake and Spill* using 10 counters. This will prepare them for the next section of lessons—finding pairs of addends that make 10.

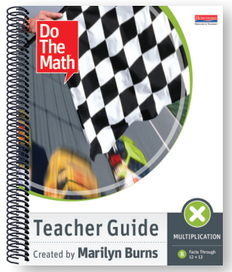


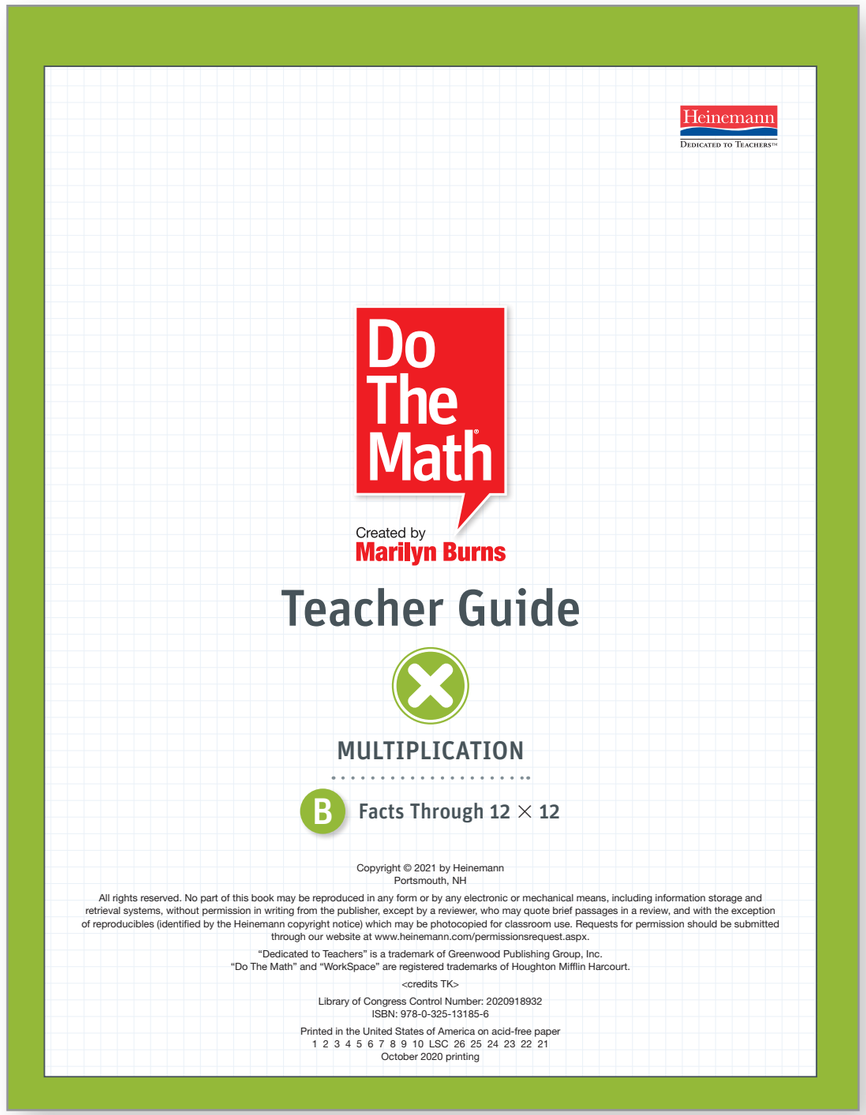
DO THE MATH TEACHER GUIDE **SAMPLER**

MULTIPLICATION

This Sampler includes select pages from the Multiplication Teacher Guide. You'll see a sample of the:

- Section Overview
- Instructional Principals
- Letter from Marilyn Burns
- Planner
- Lessons
- Annotated *WorkSpace*
- Show What You Know, Objectives Tracker, Community News





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To access the eSampler, please visit **Heinemann.com/DoTheMath.**

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Overview

Introduction to *Do The Math*

The Lessons

LESSONS 1–5

PAGE 1

Understand the *Multiplication Chart*

Students strengthen their understanding of multiplication as they relate the number of squares in rectangles to products on the *Multiplication Chart*.

LESSONS 6–10

PAGE 25

Understand the *Multiplication Chart*

Students recreate the *Multiplication Chart* through hands-on experiences with rectangles and rectangle splitting.

LESSONS 11–15

PAGE 45

Identify Patterns on the *Multiplication Chart*

Students develop increased familiarity with products on the *Multiplication Chart* by exploring the visual patterns of multiples. The game *Pathways* provides practice for multiplying with factors 3 through 8.

LESSONS 16–20

PAGE 69

Learn About Square Numbers

Bats on Parade provides a context for learning about square numbers and exploring the pattern of square numbers on the *Multiplication Chart*. *Silent Multiplication* focuses students' attention on the pattern of products when one factor is 10.

LESSONS 21–25

PAGE 93

Practice Multiplication Facts

Students focus on the basic multiplication facts, playing a game and re-experiencing *Silent Multiplication* as they determine the products they know and practice the products they need to learn.

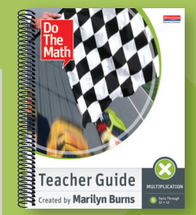
LESSONS 26–30

PAGE 117

Practice Multiplication

Students review what they've experienced during the lessons and contribute to the creation of a concept web. They progress from the geometric strategy of rectangle splitting to a related strategy of number splitting to find products.

Additional Resources



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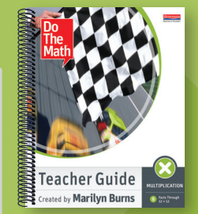

Instructional Principles

Help At-Risk and Struggling Students
Succeed in Math

Research shows that students with diverse needs succeed in learning mathematics through explicit, intentional teaching based on proven instructional strategies.

TEACHING FOR UNDERSTANDING

Students benefit from instruction based on teaching for understanding.

Step-by-step lessons help students develop understanding, learn mathematical skills, see relationships, and make connections.

- Learning experiences link concepts and skills to their mathematical representations and language.
- Students use concrete and pictorial models to build a strong foundation in key mathematical concepts, operations, and strategies.

SCAFFOLDED CONTENT

Scaffolding of the content makes the mathematics more accessible to students.

Do The Math focuses on key content in mathematics so that students are not overwhelmed with extraneous material.

- The content is organized into manageable chunks.
- The lessons are explicit about the relationships among these chunks.
- The instruction is carefully sequenced to help students build a solid foundation of understanding.

MULTIPLICATION MODELS

Grid Charts are used to apply the distributive property of multiplication by splitting rectangles.

Tiles represent multiplication with arrays.

Multiplication Charts help students to find the product of two factors.

Number cubes are used to identify random digits in multiplication games.

Egg cartons demonstrate multiplying by 12.

MULTIPLE STRATEGIES

Exploring different strategies for developing concepts and skills builds students' reasoning.

The lessons engage students with each concept and skill in several ways, deepening their mathematics knowledge.

- Hands-on **manipulatives** give students concrete experiences with abstract ideas.
- The **digital mTools** give students the opportunity to translate concrete manipulatives to pictorial representations.
- **Classroom** and **digital partner games** offer engaging experiences that reinforce mathematical understandings and skills.
- **Children's literature** provides a springboard for instruction.
- Contexts make abstract mathematical ideas accessible.

MATHEMATICAL THINKING

These standards help develop mathematical expertise and habits of mind in all students.

- Students **persevere and solve problems** and look for entry points to solutions.
- Students **reason abstractly** to make sense of quantities and their relationships in problem situations.
- Students use stated assumptions, definitions, and previously established results to **construct viable arguments**.
- Students **model with mathematics** to solve real-world and mathematical problems.
- Students apply **mathematical** and **practical tools** strategically when solving problems.
- Students **attend to precision**, using mathematical language to communicate clearly and accurately.
- Students look closely to **discern patterns** or **structure** when solving problems.
- Students **use repeated reasoning** to identify general methods and shortcuts.

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Help Students Build Their Mathematical Reasoning

CLASSROOM ROUTINES

Routines such as "think, pair, share" promote engagement and deepen student understanding.

THINK
Students collect their thoughts individually.

PAIR
Students discuss with a partner.

SHARE
Students report ideas to the whole group. Expressing ideas and hearing other perspectives help students clarify their thinking.

- The listening and speaking that occur during "think, pair, share" are especially valuable for English language learners.
- Teachers can pair English language learners with other students who speak the same first language to allow them to discuss concepts.
- Teachers can also pair a student with early English skills and a student with strong English skills to encourage language development.

INDEPENDENT STUDENT WORK

Assignments provide students with opportunities to practice, strengthen, and extend their learning.

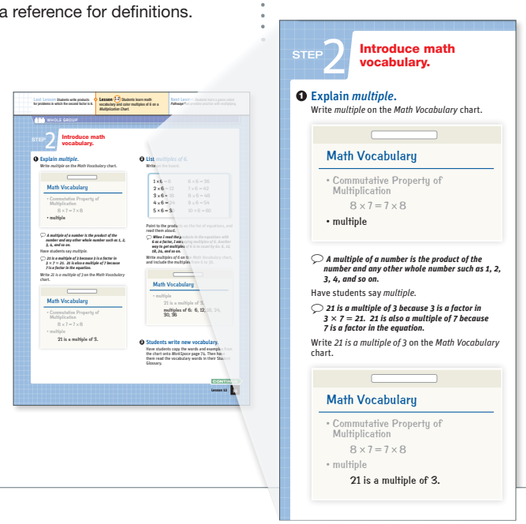
- ***WorkSpace*® assignments** are carefully constructed to motivate students and maximize their success through games, assignments for reinforcement, and problem-solving situations.
- The **digital experience** gives students the flexibility to explore mathematical tools and games within and outside the classroom.

VOCABULARY AND LANGUAGE

Explicit vocabulary instruction helps students communicate effectively about the math they are learning.

Vocabulary is introduced after students experience concepts. Vocabulary lessons follow a consistent routine—the teacher writes the vocabulary on the *Math Vocabulary* chart and provides an example; students see, hear, say, and write it; the vocabulary is then incorporated throughout the lessons to support students' learning.

- Key **mathematical** and **academic vocabulary** is highlighted at the start of each lesson, and **Spanish translations** are provided.
- A **glossary** in the *WorkSpace*® provides students with a reference for definitions.



ASSESSMENT AND DIFFERENTIATION

Ongoing assessment is built into the program to help teachers meet individual student needs.

During lessons, teachers observe students working in the whole group, with partners, and independently.

- Specific guidance for how to promote understanding and **address student misconceptions** is integrated into all lessons.
- Suggestions for **differentiating instruction** are included after every "Assessing Student Understanding" lesson, both for students who need additional help and those who are ready for a challenge.

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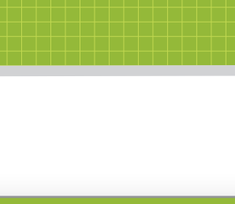
Created by Marilyn Burns

FROM MARILYN BURNS

Dear Colleague,

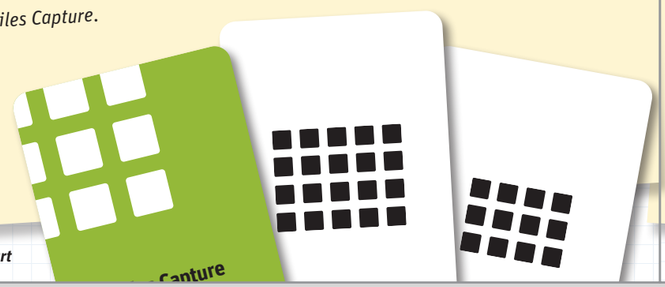
The *Multiplication Chart* is a mathematical icon in the elementary grades, and learning the multiplication facts is both a rite of passage for students and a gatekeeper for their continued success. Students typically are introduced to the *Multiplication Chart* early in their study of multiplication. While they learn early on how to use the chart to find the products of factors through 12, most have not learned how the *Multiplication Chart* was created. Also, for many, their understanding of what multiplication means is fragile, thus making the *Multiplication Chart* all the more mysterious.

In these lessons, students first focus on the meaning of multiplication by connecting arrangements of tiles in equal rows to multiplication equations.



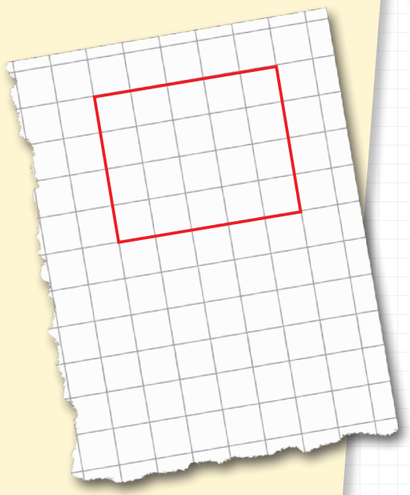
$4 \times 5 = 20$

Students practice finding the total number of tiles arranged in equal rows and writing multiplication equations to represent them with the game *Tiles Capture*.



Students review the vocabulary *factor* and *product* and how to use the *Multiplication Chart* to check their answers. Also, they learn to record the arrangements of equal rows of tiles on grid paper, which results in drawing rectangles.

×	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21
4	4	8	12	16	20	24	28
5	5	10	15	20	25	30	35



These experiences prepare students for exploring patterns on the *Multiplication Chart* and learning to relate the number of squares in rectangles to products on the chart.

Marilyn Burns

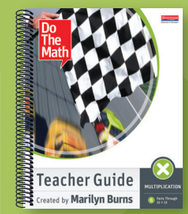
> "Learning the multiplication facts is both a rite of passage for students and a gatekeeper for their continued success."

In Lessons 1–5, students...

- Calculate products with factors 0 through 12.
- Represent arrangements of equal rows and rectangles with multiplication equations.
- Use the *Commutative Property of Multiplication* to solve problems.
- Communicate ideas with key math vocabulary: *multiplication equation*, *factor*, and *product*.

Lessons 1–5

Understand the *Multiplication Chart*



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PLANNER

Understand the *Multiplication Chart*

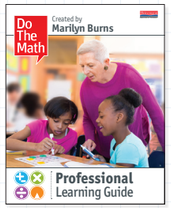
See pages 14-17 for the full lesson

See pages 18-24 for the full lesson

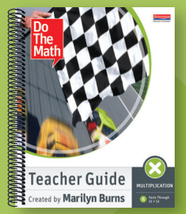
	LESSON 1	LESSON 2	LESSON 3	LESSON 4	LESSON 5
		Game			Progress Monitoring
	Relating Equal Rows of Tiles to Multiplication Students figure the number of tiles in equal rows of tiles without counting one-by-one, and write multiplication equations for the tile arrangements.	**Writing Equations in *Tiles Capture*** Students practice multiplying with factors from 1 through 6 by playing the multiplication game *Tiles Capture*.	**Exploring the *Multiplication Chart*** Students find products on a *Multiplication Chart* that shows 144 products, and relate rectangles to multiplication equations.	**Relating Rectangles to Multiplication Equations** Students build rectangles with tiles, write related multiplication equations, and relate the rectangles to products on a *Multiplication Chart*.	**Assessing Student Understanding** Students demonstrate understanding of the objectives of Lessons 1–4 by completing *WorkSpace* pages independently.
OBJECTIVES	• Represent arrangements of equal rows with multiplication equations. • Calculate products with factors 0 through 12.	• Represent arrangements of equal rows with multiplication equations. • Calculate products with factors 0 through 12.	• Calculate products with factors 0 through 12. • Represent arrangements of equal rows and rectangles with multiplication equations. • Use the *Commutative Property of Multiplication* to solve problems.	• Represent arrangements of equal rows and rectangles with multiplication equations. • Calculate products with factors 0 through 12. • Use the *Commutative Property of Multiplication* to solve problems.	• Represent rectangles with multiplication equations. • Calculate products with factors 0 through 12.
PURPOSE	Using the **concrete representation** of tiles arranged in equal rows helps students connect the equal rows to abstract multiplication equations.	Having students use their own ideas to figure out the numbers of tiles in equal rows allows them to solve problems at their own comfort level.	Relating a **visual representation**—the rectangle—to the **symbolic representation** of an equation reinforces the meaning of multiplication as figuring the total for equal groups or rows.	Working **cooperatively** to think, pair, share not only encourages **communication**, but benefits each student by providing the support of a partner. Students confer as they work together to figure out all of the rectangles they can make with 12 tiles.	Assessing with familiar **visual models** and **symbolic representations** allows students to show their understanding without having to approach the material in an unfamiliar format.
KEY MATH VOCABULARY	• equal • factor **NEW** • multiplication equation **NEW** • product **NEW** • times	• equal • factor • multiplication equation • product • times	• equal • factor • multiplication equation • product • times	• equal • factor • multiplication equation • product • times	• equal • factor • multiplication equation • product • times
MATERIALS Physical manipulatives are also available as digital tools for teachers and students. mTools Digital Games	• *WorkSpace* page 1 • Green tiles • Chart paper • *Community News*	• *WorkSpace* pages 2–4 • Green tiles • *Tiles Capture* cards • *Tiles Capture*	• *WorkSpace* pages 5–6 • *Multiplication Chart* • Green tiles • *Grid Chart*	• *WorkSpace* pages 5 and 7 • *Multiplication Chart* • Green tiles • *Cut-Out Rectangles* • *Grid Chart*	• *WorkSpace* pages 9–11 • Green tiles • *Multiplication Chart* • *Tiles Capture* cards • *Tiles Capture*

mTools
In these lessons, you will use:
- Tiles
- *Multiplication Chart*
- *Grid Chart*

Professional Learning Online
To support teaching these lessons:
- View "Using Manipulatives to Teach Math."
- Read "How to Make Most of Manipulatives."



Read the **Introduction** to **Multiplication**.



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LESSON 3 Exploring the *Multiplication Chart*

Last Lesson Students practice multiplying factors from 1 through 6 by playing a game.

Lesson 3 Students find products on a *Multiplication Chart* and relate rectangles to multiplication equations.

Next Lesson Students build rectangles, write related multiplication equations, and relate the rectangles to products on a *Multiplication Chart*.

Summary

Students find products on a *Multiplication Chart* that shows 144 products, and relate rectangles to multiplication equations.

Objectives

- Calculate products with factors 0 through 12.
- Represent arrangements of equal rows and rectangles with multiplication equations.
- Use the *Commutative Property of Multiplication* to solve problems.

Materials

- *WorkSpace* pages 5–6
- *Multiplication Chart*
- Green tiles
- *Grid Chart*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
equal	*igual*
factor	*factor*
multiplication equation	*ecuación de multiplicación*
product	*producto*
times	por

Academic Vocabulary

ENGLISH	SPANISH
row	fila
group	*grupo*

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire math vocabulary.

WHOLE GROUP

STEP 1 Students explore the *Multiplication Chart*.

❶ Introduce the lesson.

Display the *Multiplication Chart*.

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

💬 ***Today, we'll look at the* Multiplication Chart *and use it to find products. Then we'll see how rectangles can help with multiplication.***

❷ Demonstrate how to find the product of two factors.

Write $4 \times 3 =$ on the board.

$4 \times 3 =$

Show how to find the product by placing your left finger on the 4 in the far left column and your right finger on the 3 in the top row. Then move your left finger across from the 4 and your right finger down from the 3 until they meet at 12.

×	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21
4	4	8	12	16	20	24	28
5	5	10	15	20	25	30	35

Tell students that 12 is the product of the factors 4 and 3. Complete the equation on the board: $4 \times 3 = 12$.

❸ Guide students to use the chart to find a product.

Write $4 \times 5 =$ on the board. Tell students that they will use the *Multiplication Chart* on *WorkSpace* page 5 to find the product.

$4 \times 5 =$

💬 ***Start by putting your left finger on the 4 in the far left column and your right finger on the 5 in the top row.***

Model this on the class chart and then check that students have positioned their fingers correctly.

💬 ***Now, move your left finger across from 4 and your right finger down from 5. The product is where your fingers meet. Let's say the product together. What is the product of 4 times 5?*** (20)

Complete the equation on the board: $4 \times 5 = 20$.

$4 \times 5 = 20$

×	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21
4	4	8	12	16	20	24	28
5	5	10	15	20	25	30	35

WHOLE GROUP

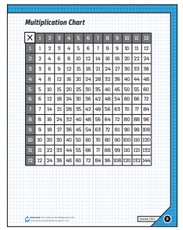
STEP 2 Students use the *Multiplication Chart*.

❶ Write problems on the board.

$4 \times 5 = 20$	$5 \times 2 =$
$6 \times 3 =$	$5 \times 5 =$
$3 \times 6 =$	$6 \times 6 =$
$2 \times 5 =$	$4 \times 6 =$

❷ Students locate products.

Have students locate the product for each problem on their *Multiplication Charts* on *WorkSpace* page 5.



Then choose one student at a time to go to the posted *Multiplication Chart* and locate the product for one problem. Record the products on the board.

$4 \times 5 = 20$	$5 \times 2 = 10$
$6 \times 3 = 18$	$5 \times 5 = 25$
$3 \times 6 = 18$	$6 \times 6 = 36$
$2 \times 5 = 10$	$4 \times 6 = 24$

CONTINUE

WHOLE GROUP

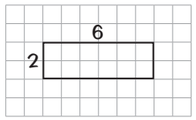
STEP 3 Build a rectangle for 2 × 6.

❶ Demonstrate how to build a rectangle to show 2 × 6.

Arrange 6 tiles in a row. Use 6 more tiles to form another row directly beneath the first row.

💬 ***This is a lot like the tile arrangements we made before, but this time I have pushed the tiles together so the tiles form a rectangle.***

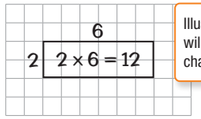
Outline the same rectangle on the *Grid Chart*.



❷ Write a multiplication equation for the 2 × 6 rectangle.

💬 ***There are 2 rows with 6 tiles in each row. We can write a multiplication equation for the rectangle.***

Write *2 × 6 = 12* inside the rectangle on the *Grid Chart*.



Illustrations of the *Grid Chart* will only show enough of the chart for your demonstrations.

Point to the parts of the equation as you read it two different ways.

💬 ***2 rows of 6 tiles equals 12 tiles.***

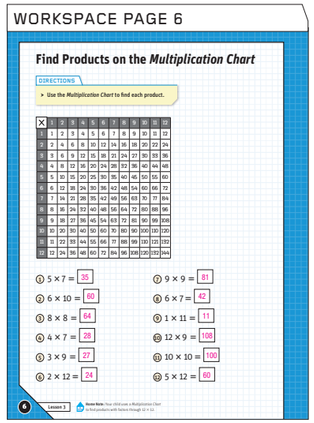
2 times 6 equals 12.

INDIVIDUALS

STEP 4 Students use a *Multiplication Chart* to find products.

❶ Students complete *WorkSpace* page 6.

Explain the directions to the *WorkSpace* page and have students complete the page independently.



WORKSPACE PAGE 6

Find Products on the *Multiplication Chart*

DIRECTIONS

▸ Use the Multiplication Chart to find each product.

×	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

ⓐ 5 × 7 = 35 ⓕ 9 × 9 = 81
ⓑ 6 × 10 = 60 ⓖ 6 × 7 = 42
ⓒ 8 × 8 = 64 ⓗ 1 × 11 = 11
ⓓ 4 × 7 = 28 ⓘ 12 × 9 = 108
ⓔ 3 × 9 = 27 ⓙ 10 × 10 = 100
ⓕ 2 × 12 = 24 ⓚ 5 × 12 = 60

6 Lesson 3 Hover Note: Hear child's use of Multiplication Chart to find products with factors through 12 × 12.

❷ Partners compare answers.

Have partners check each other's answers and resolve any differences by rechecking the *Multiplication Chart*.

SUPPORTING INSTRUCTION

When you release students to work independently on *WorkSpace* assignments, it is beneficial for them to have the support of a partner. These assignments are part of their process of learning.

Students may talk about a problem first, or tackle it on their own and then compare and share. In either case, each student should record individually, even if working with a partner.

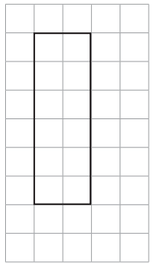
WHOLE GROUP

STEP 5 Build a rectangle for 6 × 2.

❶ Demonstrate how to build a rectangle to show 6 × 2.

Repeat the procedure for a 6 × 2 rectangle. Arrange 2 tiles in a row. Continue making rows of 2 tiles each until you have built a rectangle with 6 rows.

Then outline the arrangement on the *Grid Chart*, pointing with a finger to show each row.



💬 ***How many rows are in this rectangle?*** (6)

Write *6* to the left of the rectangle.

💬 ***How many tiles are in each row?*** (2)

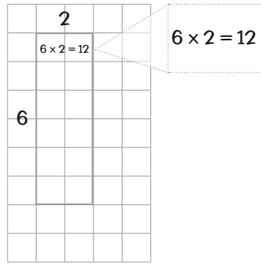
Write *2* above the rectangle.

💬 ***How many tiles are there altogether?*** (12)

❷ Write a multiplication equation for the rectangle.

💬 ***There are 6 rows with 2 tiles in each row. There are 6 equal groups, with 2 in each group. We can write a multiplication equation for this rectangle.***

Write *6 × 2 = 12* inside the rectangle on the board.



Point to the parts of the equation as you read it two different ways.

💬 ***2 rows of 6 tiles equals 12 tiles.***

2 times 6 equals 12.

STOP

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LESSON 5 Assessing Student Understanding

Last Lesson Students build rectangles, write related multiplication equations, and relate rectangles to products on a *Multiplication Chart*.

Lesson 5 Students demonstrate understanding of the objectives of Lessons 1–4.

Next Lesson Students use rectangles to record products on a *Missing Products Chart*.

Summary

Students demonstrate understanding of the objectives of Lessons 1–4 by completing *WorkSpace* pages independently.

Objectives

- Represent rectangles with multiplication equations.
- Calculate products with factors 0 through 12.

Materials

- *WorkSpace* pages 9–11
- Green tiles
- *Multiplication Chart*
- *Tiles Capture* cards
- *Tiles Capture*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
equal	*igual*
factor	*factor*
multiplication equation	*ecuación de multiplicación*
product	*producto*
times	por

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire math vocabulary.

INDIVIDUALS

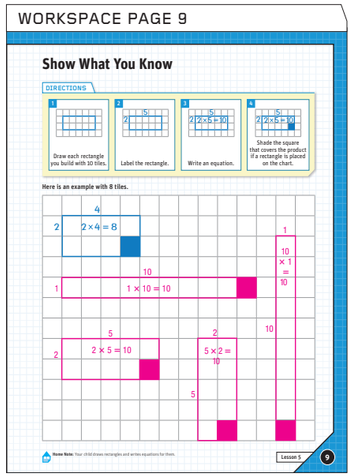
STEP 1 Students complete assessment.

❶ Introduce the lesson.

💬 ***Today, you'll show me how much you know about writing multiplication equations for rectangles. Then you'll solve some problems using your* Multiplication Chart.**

❷ Individuals complete *WorkSpace* page 9.

Have students each take 10 tiles from their kits. Explain the directions for *WorkSpace* page 9, and have students complete the page independently.


WORKSPACE PAGE 9

Show What You Know

DIRECTIONS

1 Draw each rectangle you build with 10 tiles.
2 Label the rectangle.
3 Write an equation.
4 Shade the square that covers the product if a rectangle is placed on the chart.

Here is an example with 8 tiles.

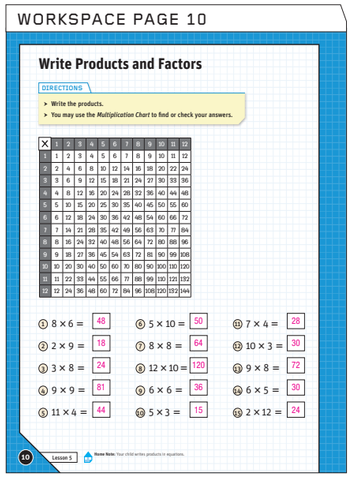
4, 2 × 4 = 8, 1, 10 × 1 = 10, 10, 1 × 10 = 10, 5, 2 × 5 = 10, 2, 5 × 2 = 10, 10

Home Note: Your child draws rectangles and writes equations for them.

Lesson 5 9

❸ Individuals complete *WorkSpace* page 10.

Explain the directions for *WorkSpace* page 10, and have students complete the page independently.


WORKSPACE PAGE 10

Write Products and Factors

DIRECTIONS

- Write the products.
- You may use the *Multiplication Chart* to find or check your answers.

① 8 × 6 = 48	⑥ 5 × 10 = 50	⑪ 7 × 4 = 28
② 2 × 9 = 18	⑦ 8 × 8 = 64	⑫ 10 × 3 = 30
③ 3 × 8 = 24	⑧ 12 × 10 = 120	⑬ 9 × 8 = 72
④ 9 × 9 = 81	⑨ 6 × 6 = 36	⑭ 6 × 5 = 30
⑤ 11 × 4 = 44	⑩ 5 × 3 = 15	⑮ 2 × 12 = 24

10 Lesson 5

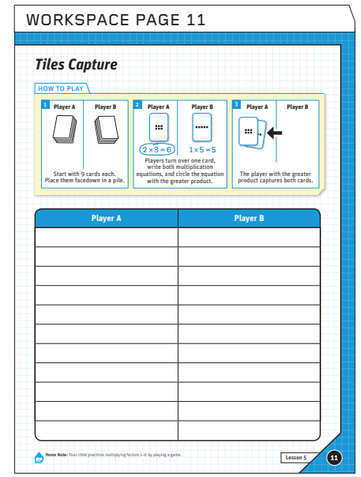
Home Note: Your child writes products in equations.

PARTNERS

STEP 2 Students play a multiplication game.

❶ Students practice and play *Tiles Capture*.

When a student completes the assessment, have him or her take a deck of *Tiles Capture* cards and practice figuring out the totals until another student completes the assessment, when the two can play the game, recording on *WorkSpace* page 11.


WORKSPACE PAGE 11

Tiles Capture

HOW TO PLAY

1 Player A Player B — Start with 9 cards each. Place them facedown in a pile.
2 Player A Player B — 2 × 3 = 6, 1 × 5 = 5 — Players turn over one card, write both multiplication equations, and circle the equation with the greater product.
3 Player A Player B — The player with the greater product captures both cards.

Player A	Player B

Home Note: Your child practices multiplying factors 1–6 by playing a game.

Lesson 5 11

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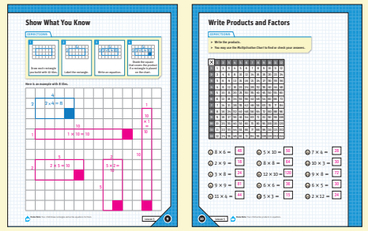
ASSESSMENT ✓ Progress Monitoring

Objectives
- Represent rectangles with multiplication equations.
- Calculate products with factors 0 through 12.
- Communicate ideas with key math vocabulary; *multiplication equation* and *product*.

Assess

Use the annotated pages to correct *WorkSpace* pages 9 and 10.



To review the full-size Annotated Teacher Version of this WorkSpace see pages 9-10

Note the progress of each student in the appropriate rows on the tracking chart found on page 142 of this guide.

Re-evaluating Student Placement

As you review each student's work from these four lessons and the assessment, you may suspect that a student does not have the foundations he or she needs to be successful in this module. You can use the End-of-Module Assessment from *Do The Math*™: *Multiplication A* to find out if the student has the necessary prerequisite skills. If the student does not score 80% on this assessment, or struggles to complete it, he or she will need additional guidance. Module A addresses these prerequisite concepts and skills.

Differentiating Instruction

Although the lessons are carefully scaffolded and paced at a rate more likely to give students a chance for optimal learning, there will be instances when students are still struggling and need extra support. Also, there will be instances when students would benefit from additional challenges or practice. Try the teaching ideas below.

For Students Who Need More Support

- Provide one-on-one additional practice for students to help remember the products.
  - State two factors from 1 through 12.
  - Have students locate the product on the *Multiplication Chart*.
  - Doing this when there is a minute or two of extra time provides students with more opportunity to hear and say factors and products.
- Play the game *Tiles Capture* with students to help use strategies for finding products, and to reinforce important multiplication language.
  - *There are 4 rows with 3 tiles in each row.*
  - *There are 4 equal groups with 3 in each group.*
  - *4 rows of 3 tiles is 4 times 3 tiles.*
  - Game instructions are available in the Teacher Bookcase, as well as on the *Do The Math* digital resources.

For Students Ready for a Challenge

- Have students play the game *Tap It.*
  - Game directions are available from the Multiplication B game variation notes on the *Do The Math* digital resources.
- Provide students with different numbers of tiles to build more rectangles.
  - Choose composite numbers of tiles such as 8, 9, or 14.
  - Building the rectangles—and writing the related equations—reinforces the idea that the number of tiles used to form a rectangle is the product of the number of rows and the number of tiles in each row.
  - It also reinforces the connection between the number of tiles and the product on the *Multiplication Chart*.

Students complete "Show What You Know" assignments every fifth lesson. These assignments help you monitor student progress and assess understanding of the concepts and skills from the previous four lessons.

Show What You Know

DIRECTIONS

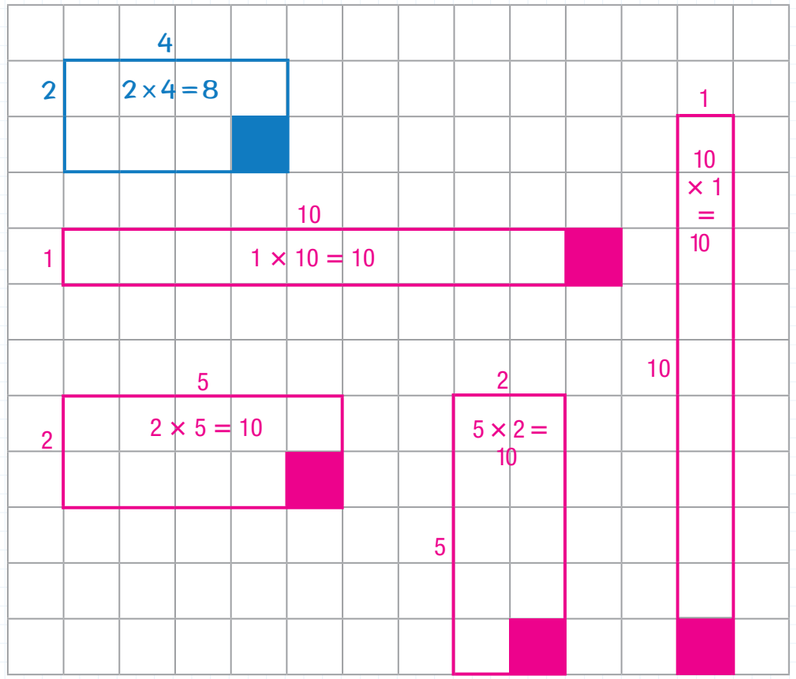
1 Draw each rectangle you build with 10 tiles.

2 Label the rectangle.

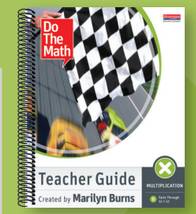
3 Write an equation.

4 Shade the square that covers the product if a rectangle is placed on the chart.

Here is an example with 8 tiles.



Home Note: Your child draws rectangles and writes equations for them.



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Write Products and Factors

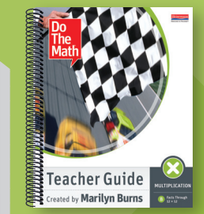
DIRECTIONS

- Write the products.
- You may use the *Multiplication Chart* to find or check your answers.

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

1. $8 \times 6 =$ 48
2. $2 \times 9 =$ 18
3. $3 \times 8 =$ 24
4. $9 \times 9 =$ 81
5. $11 \times 4 =$ 44
6. $5 \times 10 =$ 50
7. $8 \times 8 =$ 64
8. $12 \times 10 =$ 120
9. $6 \times 6 =$ 36
10. $5 \times 3 =$ 15
11. $7 \times 4 =$ 28
12. $10 \times 3 =$ 30
13. $9 \times 8 =$ 72
14. $6 \times 5 =$ 30
15. $2 \times 12 =$ 24

Home Note: Your child writes products in equations.



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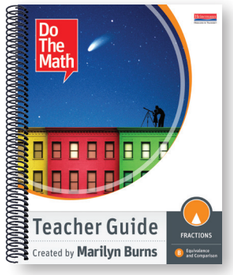
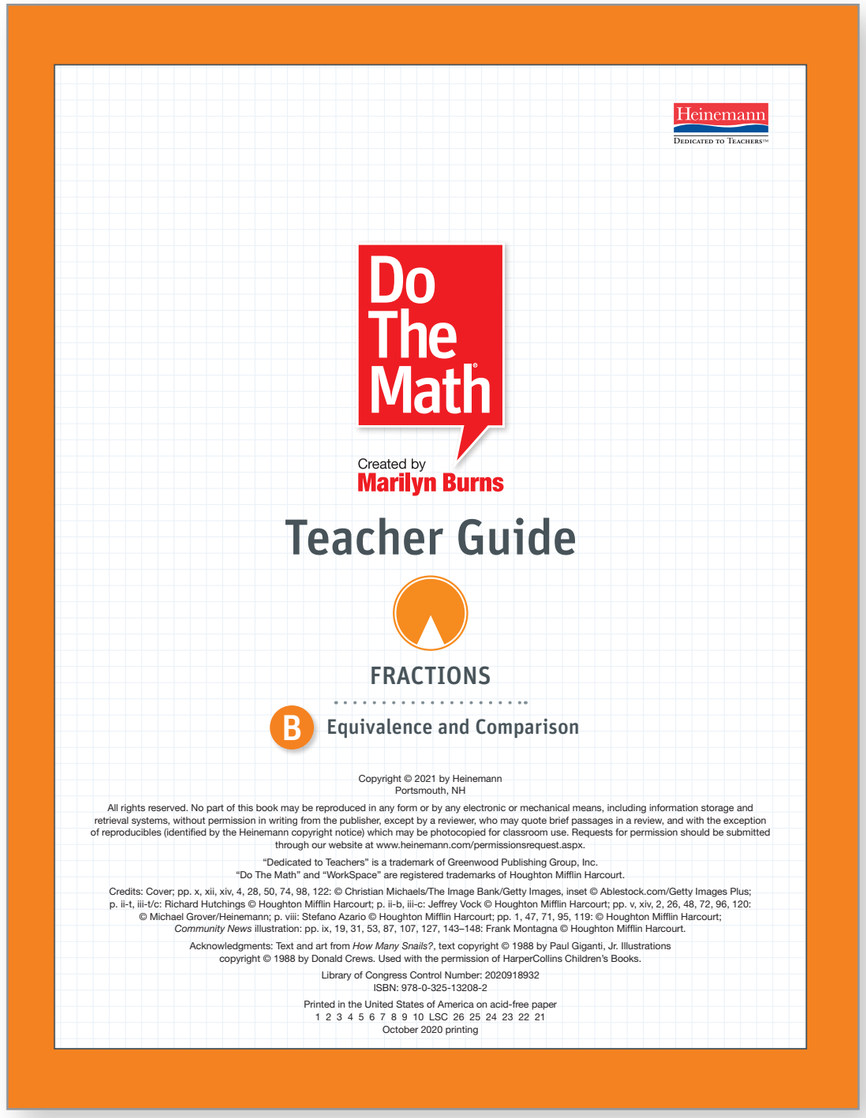
DO THE MATH TEACHER GUIDE SAMPLER

FRACTIONS

This Sampler includes select pages from the Fractions Teacher Guide. You'll see a sample of the:

- Section Overview
- Instructional Principals
- Letter from Marilyn Burns
- Planner
- Lessons
- Annotated *WorkSpace*
- Attitude Survey, Show What You Know, Objectives Tracker, Community News





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To access the eSampler, please visit **Heinemann.com/DoTheMath.**

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Overview

Introduction to *Do The Math*

The Lessons

LESSONS 1–5

PAGE 1

Introduce Comparing Fractions

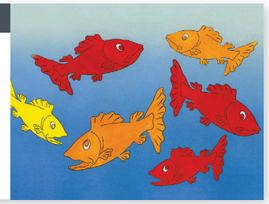
Students use fraction kits as they begin to develop a *Comparing Fractions Toolkit*. The first two strategies are *compare unit fractions* and *compare fractions with common numerators.*

LESSONS 6–10

PAGE 25

Name Fractional Parts of Sets

Students learn another strategy from the *Comparing Fractions Toolkit—compare fractions with common denominators.* They also expand their understanding of fractions to include fractions of a set.



LESSONS 11–15

PAGE 47

Identify Fractions Equivalent to $\frac{1}{2}$

Students learn a strategy from the *Comparing Fractions Toolkit—compare fractions to 1 whole.* They also use the relationships between numerators and denominators to identify fractions equivalent to $\frac{1}{2}$.

LESSONS 16–20

PAGE 71

Compare Fractions to $\frac{1}{2}$

Students learn another strategy from the *Comparing Fractions Toolkit—compare fractions to* $\frac{1}{2}$. They use cube trains to identify whether fractions of a set are less than, equal to, about equal to, or greater than $\frac{1}{2}$.

LESSONS 21–25

PAGE 95

Rename Fractions With Equivalent Fractions

Students learn the last strategy from the *Comparing Fractions Toolkit—change fractions to equivalent fractions.* They use both their fraction kits and circles to identify equivalent fractions.

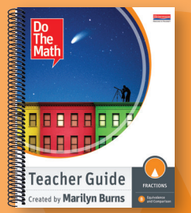
LESSONS 26–30

PAGE 119

Compare and Order Fractions

Students use all of the strategies in the *Comparing Fractions Toolkit* to compare and order fractions, including improper fractions. Through the creation of a fraction concept web, students review fraction concepts and vocabulary, and make connections.

Additional Resources



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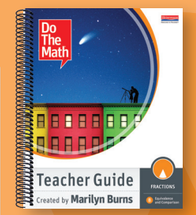

Instructional Principles

Do The Math

Help At-Risk and Struggling Students
Succeed in Math

Research shows that students with diverse needs succeed in learning mathematics through explicit, intentional teaching based on proven instructional strategies.

TEACHING FOR UNDERSTANDING

Students benefit from instruction based on teaching for understanding.

Step-by-step lessons help students develop understanding, learn mathematical skills, see relationships, and make connections.

- Learning experiences link concepts and skills to their mathematical representations and language.
- Students use concrete and pictorial models to build a strong foundation in key mathematical concepts, operations, and strategies.

SCAFFOLDED CONTENT

Scaffolding of the content makes the mathematics more accessible to students.

Do The Math focuses on key content in mathematics so that students are not overwhelmed with extraneous material.

- The content is organized into manageable chunks.
- The lessons are explicit about the relationships among these chunks.
- The instruction is carefully sequenced to help students build a solid foundation of understanding.

FRACTIONS MODELS

Fraction strips help students to identify fractions and understand fraction equivalence.

Fraction cards are used to order fractions from least to greatest.

Connecting cubes create fraction trains and represent parts of a set.

Fraction circles are divided to represent sharing problems.

Fraction cubes determine random numbers in fraction games.

MULTIPLE STRATEGIES

Exploring different strategies for developing concepts and skills builds students' reasoning.

The lessons engage students with each concept and skill in several ways, deepening their mathematics knowledge.

- Hands-on **manipulatives** give students concrete experiences with abstract ideas.
- The **digital mTools** give students the opportunity to translate concrete manipulatives to pictorial representations.
- **Classroom** and **digital partner games** offer engaging experiences that reinforce mathematical understandings and skills.
- **Children's literature** provides a springboard for instruction.
- Contexts make abstract mathematical ideas accessible.

MATHEMATICAL THINKING

These standards help develop mathematical expertise and habits of mind in all students.

- Students **persevere and solve problems** and look for entry points to solutions.
- Students **reason abstractly** to make sense of quantities and their relationships in problem situations.
- Students use stated assumptions, definitions, and previously established results to **construct viable arguments**.
- Students **model with mathematics** to solve real-world and mathematical problems.
- Students apply **mathematical** and **practical tools** strategically when solving problems.
- Students **attend to precision**, using mathematical language to communicate clearly and accurately.
- Students look closely to **discern patterns** or **structure** when solving problems.
- Students **use repeated reasoning** to identify general methods and shortcuts.

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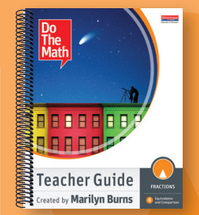


Do The Math®

Help Students Build Their
Mathematical Reasoning

CLASSROOM ROUTINES

Routines such as "think, pair, share" promote engagement and deepen student understanding.

THINK
Students collect their thoughts individually.

PAIR
Students discuss with a partner.

SHARE
Students report ideas to the whole group. Expressing ideas and hearing other perspectives help students clarify their thinking.

- The listening and speaking that occur during "think, pair, share" are especially valuable for English language learners.
- Teachers can pair English language learners with other students who speak the same first language to allow them to discuss concepts.
- Teachers can also pair a student with early English skills and a student with strong English skills to encourage language development.

INDEPENDENT STUDENT WORK

Assignments provide students with opportunities to practice, strengthen, and extend their learning.

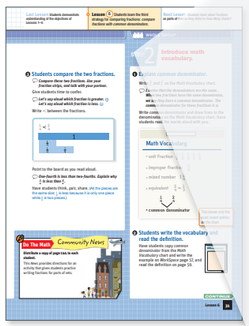
- ***WorkSpace*® assignments** are carefully constructed to motivate students and maximize their success through games, assignments for reinforcement, and problem-solving situations.
- The **digital experience** gives students the flexibility to explore mathematical tools and games within and outside the classroom.

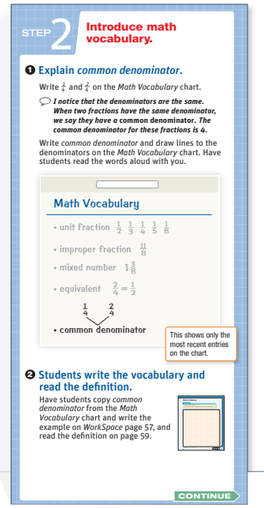
VOCABULARY AND LANGUAGE

Explicit vocabulary instruction helps students communicate effectively about the math they are learning.

Vocabulary is introduced after students experience concepts. Vocabulary lessons follow a consistent routine—the teacher writes the vocabulary on the *Math Vocabulary* chart and provides an example; students see, hear, say, and write it; the vocabulary is then incorporated throughout the lessons to support students' learning.

- Key **mathematical** and **academic vocabulary** is highlighted at the start of each lesson, and **Spanish translations** are provided.
- A **glossary** in the *WorkSpace*® provides students with a reference for definitions.





ASSESSMENT AND DIFFERENTIATION

Ongoing assessment is built into the program to help teachers meet individual student needs.

During lessons, teachers observe students working in the whole group, with partners, and independently.

- Specific guidance for how to promote understanding and **address student misconceptions** is integrated into all lessons.
- Suggestions for **differentiating instruction** are included after every "Assessing Student Understanding" lesson, both for students who need additional help and those who are ready for a challenge.

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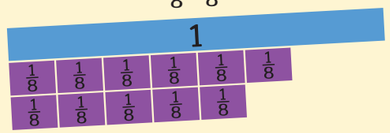
FROM MARILYN BURNS

Dear Colleague,

Students now learn the third strategy in the *Comparing Fractions Toolkit*—*comparing fractions with common denominators*. For this strategy, students compare two fractions with the same denominator. First they review that fractions with the same denominator each represent 1 whole cut into the same number of equal pieces. Then they reason that the fraction with the greater numerator has more pieces and, therefore, is the greater fraction. Finally they confirm by comparing with their fraction kit pieces.

$\frac{6}{8} > \frac{5}{8}$



The lessons also engage students in relating fractions to parts of sets, rather than parts of a single whole. The illustrations in the book *How Many Snails?* provide contexts for identifying the numerators and denominators of fractional parts of sets. Each spread in the book presents questions that ask readers to observe differences among sets of similar objects—clouds, flowers, fish, trucks, books, and others. The questions in the book were written with the intention of being answered with whole numbers; however, for these lessons, they are reworded so that students respond with answers that are fractions.

$\frac{3}{8}$ of the 8 clouds are big and fluffy.

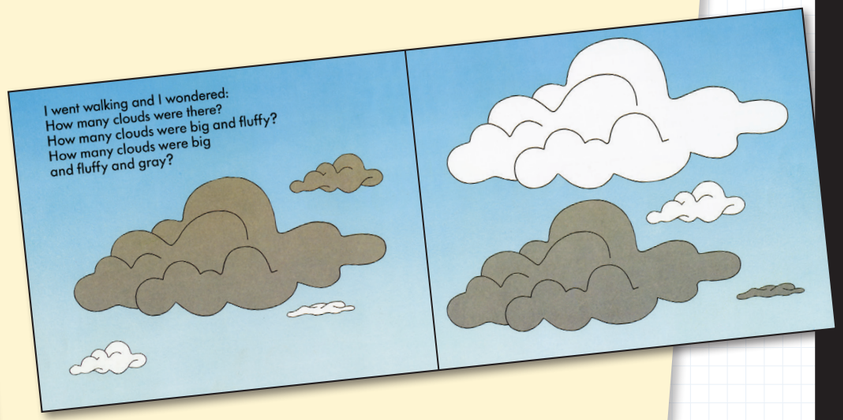
$\frac{4}{8}$ of the 8 clouds are white.

In Lessons 6–10, students...

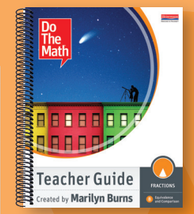
- Compare fractions with common numerators and with common denominators.
- Name parts of a set as fractions and use standard notation.
- Solve problems using fractions.
- Communicate ideas with key math vocabulary: *numerator*, *common numerator*, *denominator*, *unit fraction*, and *common denominator*.

Students then move beyond the book to identify fractional parts of other sets. Also, they draw their own representations of fractions as parts of sets. These lessons extend students' experience beyond the fractions that are in the Fraction Kit.

$\frac{4}{7}$ of the circles have an X in them.



> "The lessons also engage students in relating fractions to parts of sets, rather than parts of a single whole."



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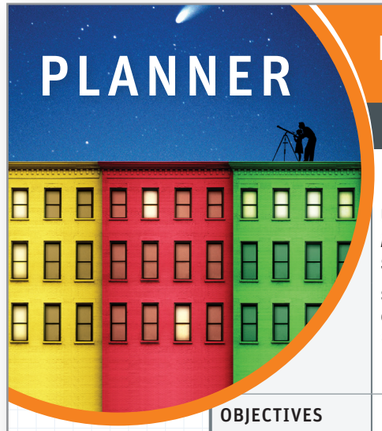


Name Fractional Parts of Sets

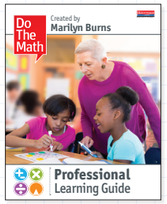
See pages 38-39 for the full lesson

See pages 44-46 for the full lesson

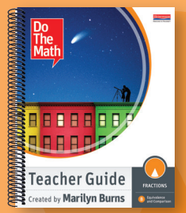
	LESSON 6	LESSON 7	LESSON 8	LESSON 9	LESSON 10
					✓ Progress Monitoring
	Using *Comparing Fractions Toolkit* Strategy 3 Students learn the third of six strategies for comparing fractions: *compare fractions with common denominators.*	**Naming Fractions for Parts of Sets** Students learn about fractions as parts of sets as they listen to *How Many Snails?* by Paul Giganti, Jr.	**Naming Fractions for Parts of Sets *(continued)*** Students continue to name fractional parts of sets.	**Representing Fractional Parts of Sets** Students make drawings to show fractional parts of sets.	**Assessing Student Understanding** Students demonstrate understanding of the objectives of Lessons 6–9 by completing *WorkSpace* pages independently.
OBJECTIVES	• Compare fractions with common denominators.	• Compare fractions with common denominators. • Name parts of sets as fractions and use standard notation. • Solve problems using fractions.	• Compare fractions with common denominators. • Name parts of sets as fractions and use standard notation. • Solve problems using fractions.	• Compare unit fractions and fractions with common denominators. • Name parts of sets as fractions and use standard notation. • Solve problems using fractions.	• Compare fractions with common numerators and common denominators. • Name parts of sets as fractions and use standard notation. • Represent fractional parts of sets with drawings and fractions. • Solve problems using fractions.
PURPOSE	Creating the *Comparing Fractions Toolkit* **builds a routine** students can follow as they compare fractions that depend on students' knowledge about fraction numbers and notation.	Answering questions based on the **visual representations** presented in the book *How Many Snails?* supports students' growing understanding of fractions as parts of sets.	Using **graphic organizers**—word problem frames—when creating questions about fractional parts of sets gives students opportunities to practice new strategies to compare fractions.	Students create **visual representations** of fractions as parts of sets, **reinforcing their understanding** of the concept.	Assessing with **visual models** and **symbolic representation** they have been using in Lessons 6–9 allows students to show their understanding without having to approach the material in an unfamiliar format.
KEY MATH VOCABULARY	• common denominator **NEW** • common numerator • denominator • numerator • unit fraction	• common denominator • denominator • is greater than • is less than • numerator	• common denominator • denominator • is greater than • is less than • numerator	• common denominator • is greater than • is less than • unit fraction	• common denominator • common numerator • is greater than • is less than • unit fraction
MATERIALS Physical manipulatives are also available as digital tools for teachers and students. mTools Digital Games	• *WorkSpace* pages 1, 9–10, 57, and 59 • Fraction strips • Magnetic fraction strips • Red and blue fraction cubes • *Math Vocabulary* chart • *Comparing Fractions Toolkit* chart • *Community News*	• *WorkSpace* page 11 • *How Many Snails?* by Paul Giganti, Jr. • Fraction strips • Magnetic fraction strips	• *WorkSpace* pages 12–13 and 49 • Fraction strips • Magnetic fraction strips • Red and blue fraction cubes • *Uncover*	• *WorkSpace* pages 14–15 and 49 • Fraction strips • Red and blue fraction cubes • *Uncover*	• *WorkSpace* pages 16–17 and 49 • Fraction strips • Red and blue fraction cubes • *Uncover*

mTools
In these lessons, you will use:
- Fraction strips
- Fraction cubes

Professional Learning Online
To support teaching these lessons:
- View "Using Children's Literature to Teach Math."
- Read "Using Story Books to Teach Math."



Take a deeper dive into **Problem Types** in **Fractions**.



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LESSON 8 Naming Fractions for Parts of Sets (continued)

Last Lesson Students learn about fractions as parts of sets as they listen to *How Many Snails?*

Lesson 8 Students continue to name fractional parts of sets.

Next Lesson Students make drawings to show fractional parts of sets.

Summary

Students continue to name fractional parts of sets.

Objectives

- Compare fractions with common denominators.
- Name parts of sets as fractions and use standard notation.
- Solve problems using fractions.

Materials

- *WorkSpace* pages 12–13 and 49
- Fraction strips
- Magnetic fraction strips
- Red and blue fraction cubes
- *Uncover*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
common denominator	*común denominador*
denominator	*denominador*
is greater than	es mayor que
is less than	es menor que
numerator	*numerador*

Academic Vocabulary

ENGLISH	SPANISH
compare	*comparar*
part	*parte*
set	conjunto
circle	*círculo*

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire vocabulary.

WHOLE GROUP

STEP 1 Students practice a toolkit strategy.

1 Introduce the lesson.

***Today you will practice comparing two fractions that have a common denominator. Then we will continue to figure out parts of sets and name fractions to represent them based on the book* How Many Snails?**

2 Present two fractions for students to compare.

Write $\frac{9}{8}$ and $\frac{7}{8}$ on the board, and have students read each fraction aloud.

$\frac{9}{8}$ $\frac{7}{8}$

Compare these fractions. Talk with your partner and use your fraction strips.

Give students time to confer.

Let's say aloud which fraction is greater. ($\frac{9}{8}$)
Let's say aloud which fraction is less. ($\frac{7}{8}$)

Write > between the fractions and have students read aloud with you as you point: $\frac{9}{8}$ *is greater than* $\frac{7}{8}$.

Choose a student to explain the comparison. Verify with magnetic fraction strips.

$\frac{9}{8} > \frac{7}{8}$

WHOLE GROUP

STEP 2 Guide students to name fractions for parts of sets.

1 Guide students to complete two problems.

Have students turn to *WorkSpace* page 12 and look at the first problem.

What will the denominator of the fraction show? (the number of birds in the whole set) ***What is the denominator of the fraction?*** (8)

How many birds are red? (5) ***So, the fraction of birds that are red is $\frac{5}{8}$.***

Have students write the fraction on the *WorkSpace* page.

Now let's look at the second problem. How many blue birds are there? (3)

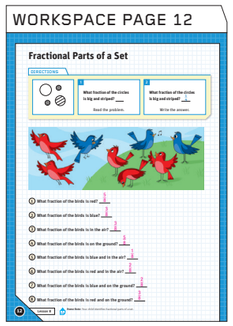
We already know the denominator, because the number in the whole set hasn't changed. So what fraction of the birds is blue?

Have students think, pair, share. ($\frac{3}{8}$)

Have students write the fraction on the *WorkSpace* page.

2 Students complete *WorkSpace* page 12.

Have students complete the *WorkSpace* page.


WORKSPACE PAGE 12

Fractional Parts of a Set

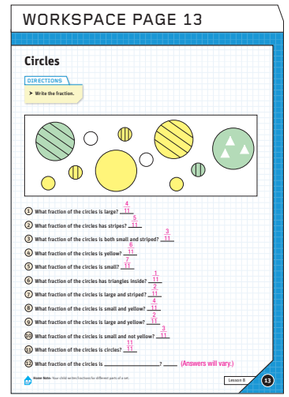
INDIVIDUALS

STEP 3 Students name fractions for parts of sets.

1 Students complete *WorkSpace* page 13.

Have students turn to *WorkSpace* page 13. Explain that they will answer the questions by writing a fraction for the part of the set described. Remind them that they must first figure out how many are in the whole set.

Then read the questions aloud and, if necessary, explain meanings of words such as *stripes* and *circle*.


WORKSPACE PAGE 13

Circles

DIRECTIONS

Write the fraction.

2 Students practice with *Uncover* or *Roll Five*.

Students who complete the *WorkSpace* assignment and have extra time should play *Uncover* or *Roll Five*. Students may use either the blue fraction cube or the red fraction cube.

If students choose *Roll Five*, have them record their equations on one of the recording pages that start on *WorkSpace* page 49.

STOP

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LESSON 10 Assessing Student Understanding

Last Lesson Students make drawings to show fractional parts of sets.

Lesson 10 Students demonstrate understanding of the objectives of Lessons 6–9.

Next Lesson Students learn a new strategy for comparing fractions—*comparing fractions that are one unit fraction from 1 whole.*

Summary

Students demonstrate understanding of the objectives of Lessons 6–9 by completing *WorkSpace* pages independently.

Objectives

- Compare fractions with common numerators and common denominators.
- Name parts of sets as fractions and use standard notation.
- Represent fractional parts of sets with drawings and fractions.
- Solve problems using fractions.

Materials

- *WorkSpace* pages 16–17 and 49
- Fraction strips
- Red and blue fraction cubes
- *Uncover*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
common denominator	*común denominador*
common numerator	*común numerador*
is greater than	es mayor que
is less than	es menor que
unit fraction	*fracción unitaria*

Academic Vocabulary

ENGLISH	SPANISH
compare	*comparar*
part	*parte*
set	conjunto

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire vocabulary.

WHOLE GROUP

STEP 1 Students practice toolkit strategies.

❶ Introduce the lesson.

💬 ***Today you will practice comparing fractions. Then you will complete an assignment that will help me know what you've learned about fractions so far and how I can help you learn more. If there is still time, you can choose* Uncover *or* Roll Five.**

❷ Present two pairs of fractions to compare.

Write the two pairs of fractions on the board: $\frac{9}{13}$ and $\frac{12}{13}$, $\frac{5}{6}$ and $\frac{5}{11}$. Then have students read each fraction aloud.

💬 ***Compare the first pair of fractions. Talk with your partner.***

Give students time to confer.

💬 ***Let's say aloud which fraction is greater.*** $(\frac{12}{13})$
Let's say aloud which fraction is less. $(\frac{9}{13})$

Write < between the fractions and have students read aloud with you as you point: $\frac{9}{13}$ *is less than* $\frac{12}{13}$.

$$\frac{9}{13} < \frac{12}{13}$$
$$\frac{5}{6} \quad \frac{5}{11}$$

Choose a student to explain. ($\frac{9}{13}$ and $\frac{12}{13}$ have common denominators; twelve one-thirteenths is greater than nine one-thirteenths.)

❸ Students compare the second pair of fractions.

Repeat the process for $\frac{5}{6}$ and $\frac{5}{11}$.

$$\frac{9}{13} < \frac{12}{13}$$
$$\frac{5}{6} > \frac{5}{11}$$

INDIVIDUALS

STEP 2 Students complete an assessment.

❶ Explain the directions for the assessment.

Have students turn to *WorkSpace* page 16. Explain that these are pairs of fractions for them to compare using their *Comparing Fractions Toolkit* strategies. They should write < or > between each pair of fractions on the page.

Then have them look at page 17. Tell them that they will make a drawing for each sentence.

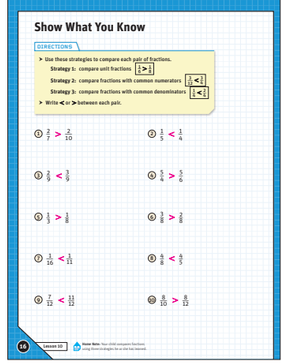
❷ Students complete both pages independently.

❸ Students practice with *Uncover* or *Roll Five*.

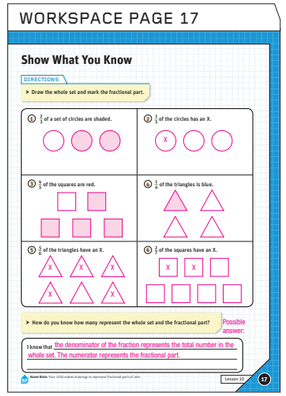
If students finish the assessment, and if time allows, they can choose either *Uncover* or *Roll Five*.

If students choose *Roll Five*, have them record their equations on one of the recording pages that start on *WorkSpace* page 49.

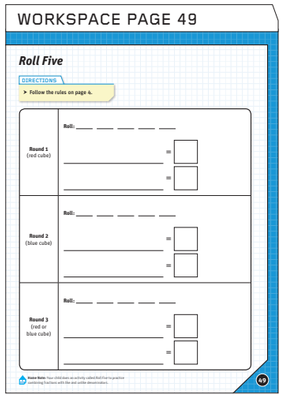
WORKSPACE PAGE 16



WORKSPACE PAGE 17



WORKSPACE PAGE 49



AFTER THE LESSON

The Attitude Survey measures students' disposition towards math.

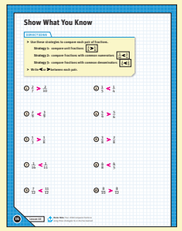
ASSESSMENT ✓ Progress Monitoring

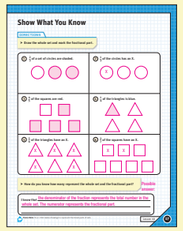
Objectives

- Compare fractions with common numerators and common denominators.
- Name parts of sets as fractions and use standard notation.
- Represent fractional parts of sets with drawings and fractions.
- Solve problems using fractions.
- Communicate ideas with key math vocabulary: *common numerator*, *unit fraction*, and *common denominator*.

Assess

Use the annotated pages to correct *WorkSpace* pages 16 and 17.





Note the progress of each student in the appropriate rows on the tracking chart on page 142.

Differentiating Instruction

Although the lessons are carefully scaffolded and paced at a rate most likely to give students a chance for optimal learning, there will be instances when some students are still struggling and need extra support. Likewise, there will be instances when some students would benefit from additional challenges or practice. Try the teaching ideas below.

For Students Who Need More Support

- If students have difficulty comparing fractions using the three toolkit strategies that have been presented, have them practice comparing fractions that can be verified with their fraction strips. Have students think and predict which fraction will be greater, then check using the fraction strips.

For Students Ready for a Challenge

- Have students grab a handful of change and use it to describe parts of a set.

In this example, the set of coins can be described in the following ways:

- $\frac{4}{10}$ quarters
- $\frac{6}{10}$ pennies
- $\frac{7}{10}$ heads
- $\frac{3}{10}$ tails

Students can ask each other questions about their sets of coins. It is easy to grab different handfuls of coins to come up with many different sets and fractions of sets.

ATTITUDE SURVEY

Name: _____ Date: _____

➤ Fill in the circle of the answer that best fits you.

1. I like math.
- ○ not at all
- ○ a little
- ○ some, but it's not my favorite
- ○ it's my favorite subject

2. I am good at math.
- ○ not at all
- ○ not very good
- ○ fairly good
- ○ very good

3. I need good math skills so I can get a good job when I am older.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

4. I can get better in math if I work hard.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

5. I like solving different problems.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

6. I believe that math problems can often be solved using different strategies.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

➤ Which of these do you agree with? You may choose more than one answer.

7. When math is challenging, I _____.
- ○ take on the challenge.
- ○ give up easily.
- ○ put in a little effort.
- ○ put in a lot of effort.
- ○ ask my teacher for help.

➤ Write an answer to each question.

8. What do you like most about math? Explain.

_____

_____

_____

_____

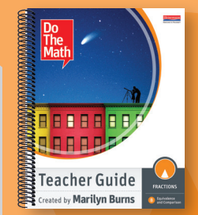
9. What do you like least about math? Explain.

_____

_____

_____

_____



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Students complete "Show What You Know" assignments every fifth lesson. These assignments help you monitor student progress and assess understanding of the concepts and skills from the previous four lessons.

Show What You Know

DIRECTIONS

- Use these strategies to compare each pair of fractions.
  - **Strategy 1:** compare unit fractions $\frac{1}{6} > \frac{1}{8}$
  - **Strategy 2:** compare fractions with common numerators $\frac{3}{12} < \frac{3}{4}$
  - **Strategy 3:** compare fractions with common denominators $\frac{1}{4} < \frac{2}{4}$
- Write < or > between each pair.

1. $\frac{2}{7} > \frac{2}{10}$
2. $\frac{1}{5} < \frac{1}{4}$
3. $\frac{2}{9} < \frac{3}{9}$
4. $\frac{5}{4} > \frac{5}{6}$
5. $\frac{1}{3} > \frac{1}{8}$
6. $\frac{3}{8} > \frac{2}{8}$
7. $\frac{1}{16} < \frac{1}{11}$
8. $\frac{4}{8} < \frac{4}{5}$
9. $\frac{7}{12} < \frac{11}{12}$
10. $\frac{8}{10} > \frac{8}{12}$

Home Note: Your child compares fractions using three strategies he or she has learned.

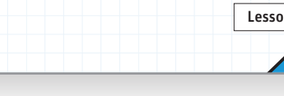
Show What You Know

DIRECTIONS

- Draw the whole set and mark the fractional part.

1. $\frac{2}{3}$ of a set of circles are shaded.

2. $\frac{1}{3}$ of the circles has an X.



3. $\frac{4}{5}$ of the squares are red.

4. $\frac{1}{4}$ of the triangles is blue.

5. $\frac{5}{6}$ of the triangles have an X.

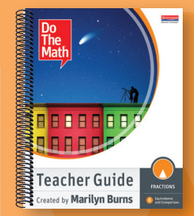
6. $\frac{2}{7}$ of the squares have an X.

- How do you know how many represent the whole set and the fractional part?

Possible answer:

I know that the denominator of the fraction represents the total number in the whole set. The numerator represents the fractional part.

Home Note: Your child makes drawings to represent fractional parts of sets.



Objectives Tracker

➤ Record the date in the appropriate box as students are assessed on each of the objectives. When the student consistently performs an objective with accuracy, add a checkmark to the box.

☑ MODULE OBJECTIVES	STUDENT NAMES							
Name parts of a whole and parts of a set as fractions and use standard notation.								
Compare and order fractions using benchmarks, common numerators, common denominators, and fractions one unit fraction away from 1 whole.								
Identify equivalent fractions.								
Solve problems using fractions.								
Communicate ideas with key math vocabulary: *numerator*, *common numerator*, *denominator*, *unit fraction*, *improper fraction*, *mixed number*, *equivalent*, and *common denominator*.								

Connecting Home to School: Send home copies of *Do The Math* Community News letters before each group of five lessons to encourage family involvement.

Do The Math

Community News

Notes of interest to the classroom teachers and families of students participating in the ***Do The Math*** program

FRACTIONS B Equivalence and Comparison LESSONS 1–5

UPDATE: Students learn strategies for comparing fractions with the same numerator. For example, they learn that $\frac{1}{4}$ is greater than $\frac{1}{8}$ and $\frac{2}{3}$ is greater than $\frac{2}{5}$.

Fraction Flags

➤ Here is an activity that will give your child practice comparing fractions.

In each of the flags below, part of the flag is white. Write a fraction for the white part of each flag. Then put the fractions in order from least to greatest.

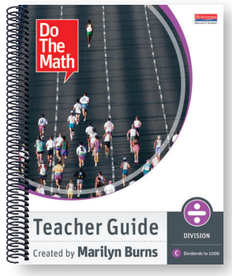
Here is a hint: write each fraction with the same numerator, 2.

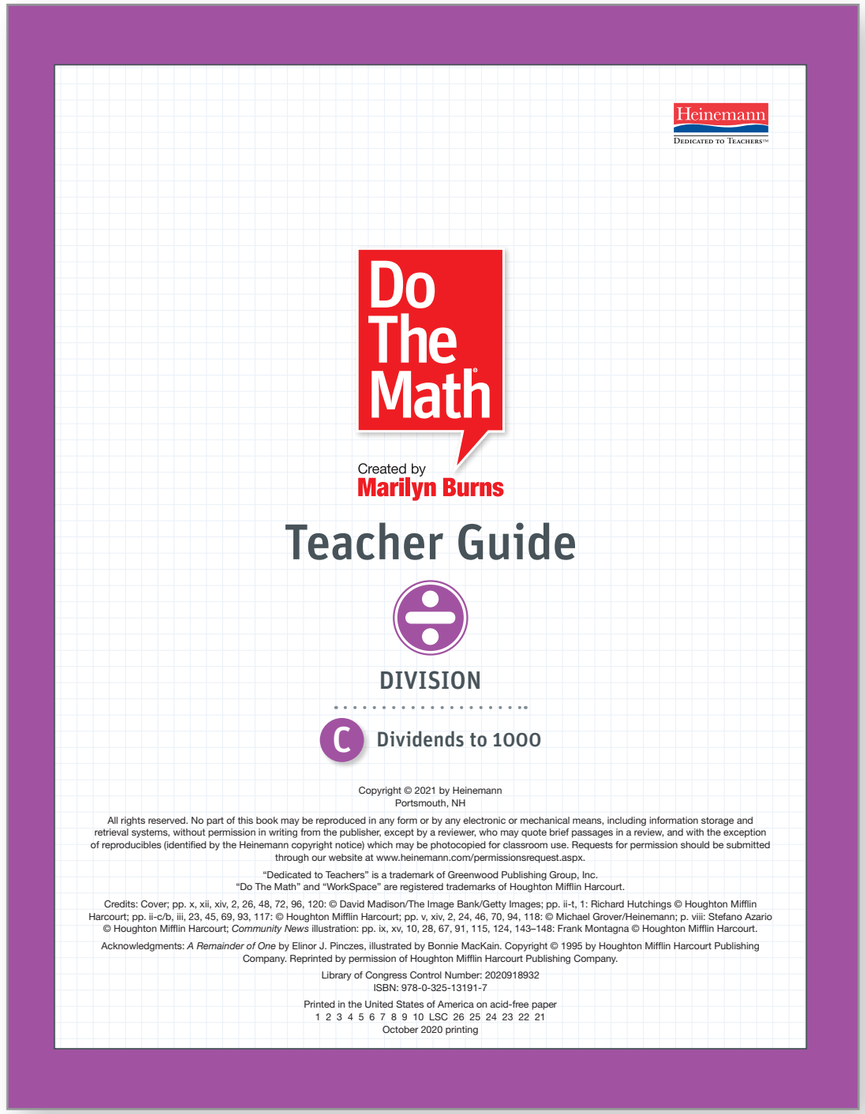
DO THE MATH TEACHER GUIDE SAMPLER

DIVISION

This Sampler includes select pages from the Division Teacher Guide. You'll see a sample of the:

- Section Overview
- Instructional Principals
- Letter from Marilyn Burns
- Planner
- Lessons
- Annotated *WorkSpace*
- Attitude Survey, Show What You Know, Objectives Tracker, Community News





To see additional *Do The Math* samplers, please visit **http://hein.pub/DoTheMathSamplers**

To access the eSampler, please visit **Heinemann.com/DoTheMath.**

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Overview

Introduction to *Do The Math*

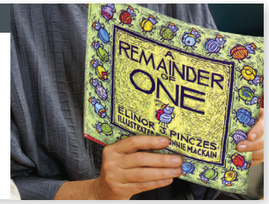
The Lessons

LESSONS 1–5

PAGE 1

Write Division Equations

Students write division equations; identify numbers that are divisible by 2, 3, 4, and 5; and relate division to multiplication.



LESSONS 6–10

PAGE 23

Solve Division Problems

Students solve division problems related to different contexts—assembling tricycles and toy cars—and record in a way that will translate later to division with greater numbers.

LESSONS 11–15

PAGE 45

Solve Division Problems

Students continue to solve division problems related to various contexts—assembling tricycles, toy cars, and bicycles—but now with greater dividends.

LESSONS 16–20

PAGE 69

Divide Three-Digit Dividends

Students solve division problems with three-digit dividends and one-digit divisors.

LESSONS 21–25

PAGE 93

Divide by Multiples of 10 From 10 to 90

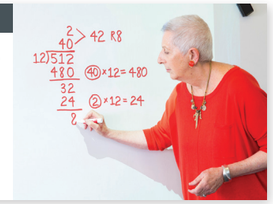
Students solve division problems using the context of exchanging pennies for dimes, and then divide three-digit numbers by multiples of 10.

LESSONS 26–30

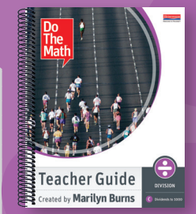
PAGE 117

Divide by Two-Digit Divisors

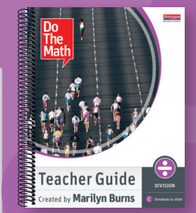
Students solve problems by dividing two-digit and three-digit dividends by two-digit divisors.



Additional Resources



Do The Math
Created by Marilyn Burns



Instructional Principles

Do The Math

Help At-Risk and Struggling Students
Succeed in Math

Research shows that students with diverse needs succeed in learning mathematics through explicit, intentional teaching based on proven instructional strategies.

TEACHING FOR UNDERSTANDING

Students benefit from instruction based on teaching for understanding.

Step-by-step lessons help students develop understanding, learn mathematical skills, see relationships, and make connections.

- Learning experiences link concepts and skills to their mathematical representations and language.
- Students use concrete and pictorial models to build a strong foundation in key mathematical concepts, operations, and strategies.

SCAFFOLDED CONTENT

Scaffolding of the content makes the mathematics more accessible to students.

Do The Math focuses on key content in mathematics so that students are not overwhelmed with extraneous material.

- The content is organized into manageable chunks.
- The lessons are explicit about the relationships among these chunks.
- The instruction is carefully sequenced to help students build a solid foundation of understanding.

DIVISION MODELS

Pennies and **dimes** are divided by 10 to model grouping problems.

Tiles represent the division of concrete objects into equal groups.

Number cubes generate random numbers in division games.

Division Bingo cards build students' fluency with division.

MULTIPLE STRATEGIES

Exploring different strategies for developing concepts and skills builds students' reasoning.

The lessons engage students with each concept and skill in several ways, deepening their mathematics knowledge.

- Hands-on **manipulatives** give students concrete experiences with abstract ideas.
- The **digital mTools** give students the opportunity to translate concrete manipulatives to pictorial representations.
- **Classroom** and **digital partner games** offer engaging experiences that reinforce mathematical understanding and skills.
- **Children's literature** provides a springboard for instruction.
- Contexts make abstract mathematical ideas accessible.

MATHEMATICAL THINKING

These standards help develop mathematical expertise and habits of mind in all students.

- Students **persevere and solve problems** and look for entry points to solutions.
- Students **reason abstractly** to make sense of quantities and their relationships in problem situations.
- Students use stated assumptions, definitions, and previously established results to **construct viable arguments**.
- Students **model with mathematics** to solve real-world and mathematical problems.
- Students apply **mathematical** and **practical tools** strategically when solving problems.
- Students **attend to precision**, using mathematical language to communicate clearly and accurately.
- Students look closely to **discern patterns** or **structure** when solving problems.
- Students **use repeated reasoning** to identify general methods and shortcuts.

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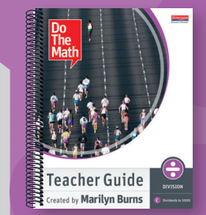


Do The Math

Help Students Build Their
Mathematical Reasoning

CLASSROOM ROUTINES

Routines such as "think, pair, share" promote engagement and deepen student understanding.

THINK
Students collect their thoughts individually.

PAIR
Students discuss with a partner.

SHARE
Students report ideas to the whole group. Expressing ideas and hearing other perspectives help students clarify their thinking.

- The listening and speaking that occur during "think, pair, share" are especially valuable for English language learners.
- Teachers can pair English language learners with other students who speak the same first language to allow them to discuss concepts.
- Teachers can also pair a student with early English skills and a student with strong English skills to encourage language development.

INDEPENDENT STUDENT WORK

Assignments provide students with opportunities to practice, strengthen, and extend their learning.

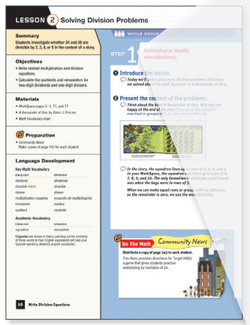
- ***WorkSpace*® assignments** are carefully constructed to motivate students and maximize their success through games, assignments for reinforcement, and problem-solving situations.
- The **digital experience** gives students the flexibility to explore mathematical tools and games within and outside the classroom.

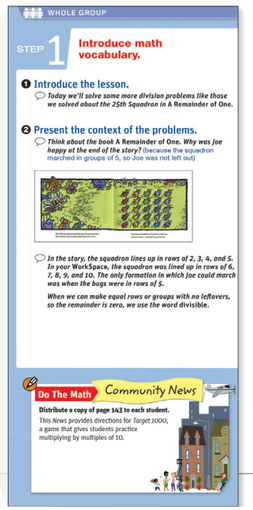
VOCABULARY AND LANGUAGE

Explicit vocabulary instruction helps students communicate effectively about the math they are learning.

Vocabulary is introduced after students experience concepts. Vocabulary lessons follow a consistent routine—the teacher writes the vocabulary on the *Math Vocabulary* chart and provides an example; students see, hear, say, and write it; and the vocabulary is then incorporated throughout the lessons to support students' learning.

- Key **mathematical** and **academic vocabulary** is highlighted at the start of each lesson, and **Spanish translations** are provided.
- A **glossary** in the *WorkSpace* provides students with a reference for definitions.





ASSESSMENT AND DIFFERENTIATION

Ongoing assessment is built into the program to help teachers meet individual student needs.

During lessons, teachers observe students working in the whole group, with partners, and independently.

- Specific guidance for how to promote understanding and **address student misconceptions** is integrated into all lessons.
- Suggestions for **differentiating instruction** are included after every "Assessing Student Understanding" lesson, both for students who need additional help and those who are ready for a challenge.

Do The Math
Created by Marilyn Burns

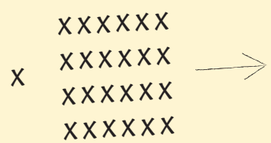
FROM MARILYN BURNS

Dear Colleague,

Reading aloud the book *A Remainder of One* begins this module. This book tells the story of Joe, a soldier bug who is part of the 25th Squadron. Joe loved to march with his squadron when they paraded to make their queen proud. But when the 25 bugs in the troop lined up in twos, Joe didn't have a partner and had to march by himself at the end. But the queen, who liked things tidy, was not pleased and Joe had to stand aside. He wasn't happy to find himself labeled remainder of one!

The same problem arose when the squadron marched in threes and then in fours. Finally, when the troop organized in fives, Joe was included. The story provides an excellent review for writing division equations; recording and interpreting remainders; and reviewing the division vocabulary of *dividend*, *divisor*, *quotient*, *remainder*, and *divisible*.

25 ÷ 4 = 6 R1
dividend divisor quotient remainder



25th Squadron marching in rows of 4

Students then investigate Joe's chances of marching in different formations if he joined other squadrons—including the 20th, 24th, 30th, 32nd, and 40th.

Following these experiences, students learn to play the game of *Target 1000*, which provides them practice multiplying by multiples of 10 up to 100, a skill that is essential for successfully solving division problems with greater numbers. To play, students take six turns, each time rolling a 1–6 number cube, multiplying the number that comes up by a multiple of 10, and adding the scores for each turn.

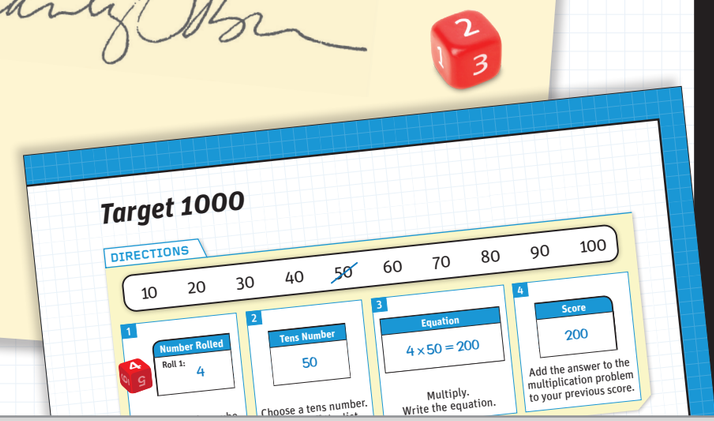
10 20 30 40 ~~50~~ ~~60~~ 70 80 90 100

	Score
4 × 50 = 200	200
5 × 60 = 300	500
1 × 100 = 100	600

Their goal is to get as close to 1000 as possible without going over. Also, students may use each multiple of 10 only once in their six turns, which adds an element of strategy that helps build their number sense.

Marilyn Burns

> "The book *A Remainder of One* provides an excellent review for writing division equations; recording and interpreting remainders; and reviewing the division vocabulary of *dividend*, *divisor*, *quotient*, *remainder*, and *divisible*."



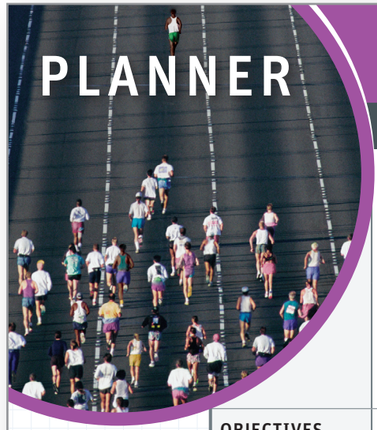
In Lessons 1–5, students...

- Write related multiplication and division equations.
- Calculate the quotients and remainders for two-digit dividends and one-digit divisors.
- Multiply one-digit numbers by multiples of 10 from 10 to 100.
- Communicate ideas with key math vocabulary: *division equation, dividend, divisor, quotient, remainder,* and *divisible.*

Lessons 1–5

Write Division Equations

Do The Math
Created by Marilyn Burns



PLANNER

Write Division Equations

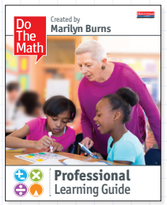
See pages 14-15 for the full lesson

See pages 20-22 for the full lesson

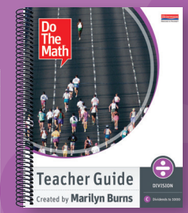
	LESSON 1	LESSON 2	LESSON 3	LESSON 4	LESSON 5
				Game	Progress Monitoring
	Writing Division Equations Students write division equations and learn division vocabulary in the context of a story.	**Solving Division Problems** Students investigate whether 24 and 30 are divisible by 2, 3, 4, or 5 in the context of a story.	**Figuring Out the Divisibility of Two-Digit Numbers** Students determine whether other numbers are divisible by 2, 3, 4, or 5.	**Learning *Target 1000*, a Multiplication Game** Students play *Target 1000*, a game that provides practice multiplying by multiples of 10 to 100, an essential skill for division.	**Assessing Student Understanding** Students demonstrate understanding of the objectives of Lessons 1–4 by completing *WorkSpace* pages independently.
OBJECTIVES	• Calculate the quotients and remainders for two-digit dividends and one-digit divisors.	• Write related multiplication and division equations. • Calculate the quotients and remainders for two-digit dividends and one-digit divisors.	• Write related multiplication and division equations. • Calculate the quotients and remainders for two-digit dividends and one-digit divisors.	• Multiply one-digit numbers by multiples of 10 from 10 to 100.	• Write related multiplication and division equations. • Calculate the quotients and remainders for two-digit dividends and one-digit divisors.
PURPOSE	The illustrations in *A Remainder of One* provide **visual representations** of division with and without remainders. Representing the division situations with equations reinforces the connection and sets the stage for more difficult problems.	Explicit **vocabulary** instruction using the *see it, hear it, say it, write it, read it* **routine** along with the *Math Vocabulary* chart gives students access to standard math terminology.	The **routine** of identifying whether numbers are divisible by 2, 3, 4, and 5 provides valuable reinforcement.	Playing the multiplication game in **pairs** enables English language learners to practice communicating mathematical ideas while they practice multiplying by multiples of 10.	Assessing with **visual models** and **symbolic representations** that students have used allows them to demonstrate their understanding without having to approach the material in an unfamiliar context.
KEY MATH VOCABULARY	• dividend **NEW** • division equation **NEW** • divisor **NEW** • quotient **NEW** • remainder **NEW**	• dividend • divisible **NEW** • divisor • multiplication equation • remainder • quotient	• divisible • division equation • multiplication equation • remainder	• multiply • times	• division equation • multiplication equation • multiply
MATERIALS Physical manipulatives are also available as digital tools for teachers and students. mTools Digital Games	• *WorkSpace* pages 2, 71, and 77–79 • Chart paper • *A Remainder of One*, by Elinor J. Pinczes	• *WorkSpace* pages 3–4, 71, and 77 • *A Remainder of One*, by Elinor J. Pinczes • *Math Vocabulary* chart • *Community News*	• *WorkSpace* pages 4–7	• *WorkSpace* pages 8–10 • Red number cube • *Target 1000*	• *WorkSpace* pages 11–13 • Red number cube • *Target 1000*

mTools
In these lessons, you will use:
Number cubes

Professional Learning Online
To support teaching these lessons:
- View "Using Children's Literature to Teach Math."
- Read "Using Story Books to Teach Math."



Read the **Introduction** to **Division**.



LESSON 3 Figuring Out the Divisibility of Two-Digit Numbers

Last Lesson Students investigate whether 24 and 30 are divisible by 2, 3, 4, or 5.

Lesson 3 Students determine whether other numbers are divisible by 2, 3, 4, or 5.

Next Lesson Students play a game that provides practice multiplying by multiples of 10, an essential skill for division.

Summary

Students determine whether other numbers are divisible by 2, 3, 4, or 5.

Objectives

- Write related multiplication and division equations.
- Calculate the quotients and remainders for two-digit dividends and one-digit divisors.

Materials

- *WorkSpace* pages 4–7

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
divisible	*divisible*
division equation	*ecuación de división*
multiplication equation	*ecuación de multiplicación*
remainder	residuo

Academic Vocabulary

ENGLISH	SPANISH
squadron	*escuadrón*

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire vocabulary.

WHOLE GROUP

STEP 1 Review the equations for the dividend 30.

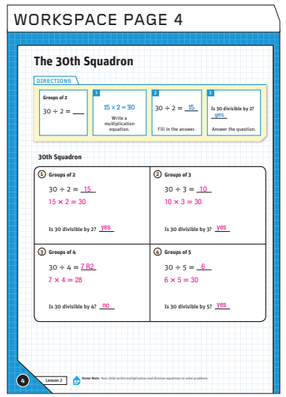
❶ Introduce the lesson.

💬 ***Today we'll solve some more division problems to find out whether other numbers are divisible by 2, 3, 4, and 5.***

❷ Students report their equations for 30.

Have students turn to *WorkSpace* page 4.

WORKSPACE PAGE 4



Choose students to read one set of division and multiplication equations each. Record the equations on the board.

30 ÷ 2 = 15	15 × 2 = 30
30 ÷ 3 = 10	10 × 3 = 30
30 ÷ 4 = 7 R2	7 × 4 = 28
30 ÷ 5 = 6	6 × 5 = 30

💬 ***Which of these numbers is 30 divisible by?*** (2, 3, and 5)
How do you know? (The division equations have no remainders.)

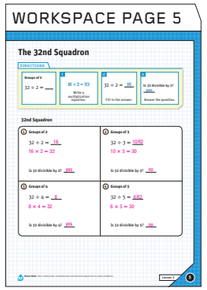
WHOLE GROUP

STEP 2 Students solve division problems.

❶ Present the problem.

Have students turn to *WorkSpace* page 5.

WORKSPACE PAGE 5



💬 ***Joe thinks that joining the 32nd Squadron might give him more chances to march. Let's figure out whether he's right.***

❷ Students solve 32 ÷ 2.

💬 ***First we'll figure out 32 ÷ 2. We'll use multiplication to help.***

Write on the board.

32 ÷ 2 = __ __ × 2 = 32

Have students think, pair, share. Choose a student to report. Record the equations on the board and have students check their equations on *WorkSpace* page 5.

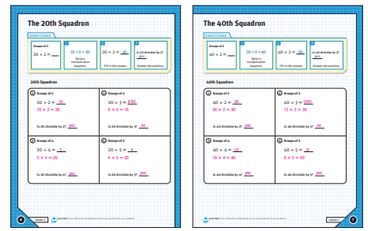
32 ÷ 2 = 16 16 × 2 = 32

💬 ***So, 32 is divisible by 2.***

❸ Students complete *WorkSpace* page 5.

Have students complete the page.

❹ Students complete *WorkSpace* pages 6 and 7.



SUPPORTING INSTRUCTION

The intent of these assignments is to reinforce for students how thinking about multiplication can be useful for solving division problems. Limiting these problems to divisors of 2, 3, 4, and 5 with dividends up to 40 makes the numbers accessible and keeps students' focus on using the connection between division and multiplication.

STOP

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LESSON 5 Assessing Student Understanding

Last Lesson Students play a game that provides practice multiplying by multiples of 10, an essential skill for division.

Lesson 5 Students demonstrate understanding of the objectives of Lessons 1–4.

Next Lesson Students learn to play a game that gives them practice with multiplication and subtraction.

Summary

Students demonstrate understanding of the objectives of Lessons 1–4 by completing *WorkSpace* pages independently.

Objectives

- Write related multiplication and division equations.
- Calculate the quotients and remainders for two-digit dividends and one-digit divisors.

Materials

- *WorkSpace* pages 11–13
- Red number cube
- *Target 1000*

Language Development

Key Math Vocabulary

ENGLISH	SPANISH
division equation	*ecuación de división*
multiplication equation	*ecuación de multiplicación*
multiply	*multiplicar*

Academic Vocabulary

ENGLISH	SPANISH
squadron	*escuadrón*

Cognates are shown in italics; pointing out the similarity of these words to their English equivalents will help your Spanish-speaking students acquire vocabulary.

WHOLE GROUP

STEP 1 Students complete an assessment.

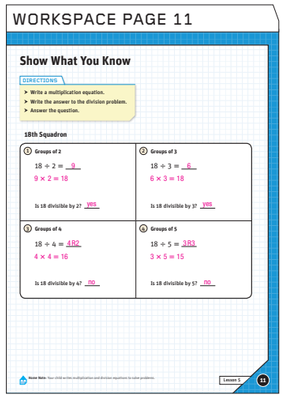
❶ Introduce the lesson.

Today you'll show me what you know by completing **WorkSpace** *pages independently. Then you'll play* **Target 1000.**

❷ Students complete WorkSpace pages 11 and 12.

Have students turn to *WorkSpace* pages 11 and 12. Explain the directions and have students complete the pages independently.

WORKSPACE PAGE 11


Show What You Know

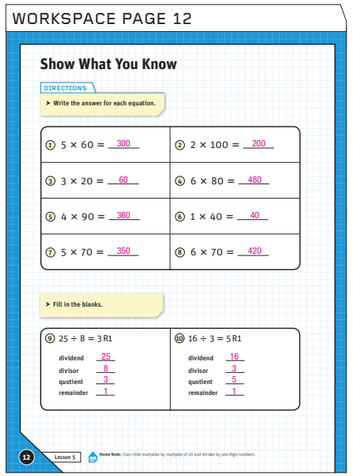
DIRECTIONS
- Write a multiplication equation.
- Write the answer to the division problem.
- Answer the question.

18th Squadron

① Groups of 2: 18 ÷ 2 = 9; 9 × 2 = 18; Is 18 divisible by 2? yes
② Groups of 3: 18 ÷ 3 = 6; 6 × 3 = 18; Is 18 divisible by 3? yes
③ Groups of 4: 18 ÷ 4 = 4R2; 4 × 4 = 16; Is 18 divisible by 4? no
④ Groups of 5: 18 ÷ 5 = 3R3; 3 × 5 = 15; Is 18 divisible by 5? no

Home Note: Your child writes multiplication and division equations to solve problems.
Lesson 5 11

WORKSPACE PAGE 12


Show What You Know

DIRECTIONS
- Write the answer for each equation.

① 5 × 60 = 300
② 2 × 100 = 200
③ 3 × 20 = 60
④ 6 × 80 = 480
⑤ 4 × 90 = 360
⑥ 1 × 40 = 40
⑦ 5 × 70 = 350
⑧ 6 × 70 = 420

- Fill in the blanks.

⑨ 25 ÷ 8 = 3R1: dividend 25; divisor 8; quotient 3; remainder 1
⑩ 16 ÷ 3 = 5R1: dividend 16; divisor 3; quotient 5; remainder 1

12 Lesson 5 Home Note: Your child multiplies by multiples of 10 and divides by one-digit numbers.

SUPPORTING INSTRUCTION

When doing assessment assignments, explain to students that they should work on their own so that you have information about what they understand and where they may need further help. Give students as much time as they need to complete the assessment pages.

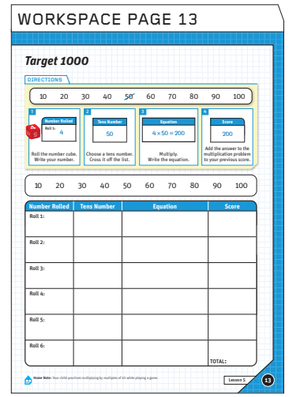
PARTNERS

STEP 2 Students play a game.

❶ Students play *Target 1000*.

Have students play the game with their partners, recording their turns on *WorkSpace* page 13.

WORKSPACE PAGE 13


Target 1000

DIRECTIONS

10 20 30 40 50 60 70 80 90 100

1 Roll the number cube. Write your number. Number Rolled: Turn 1: 4
2 Choose a tens number. Cross it off the list. Tens Number: 50
3 Multiply. Write the equation. Equation: 4 × 50 = 200
4 Add the answer to the multiplication problem to your previous score. Score: 200

Number Rolled	Tens Number	Equation	Score
Roll 1:			
Roll 2:			
Roll 3:			
Roll 4:			
Roll 5:			
Roll 6:			TOTAL:

Home Note: Your child practices multiplying by multiples of 10 while playing a game.
Lesson 5 13

AFTER THE LESSON

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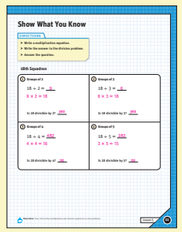
ASSESSMENT ☑ Progress Monitoring

Objectives
- Write related multiplication and division equations.
- Calculate the quotients and remainders for two-digit dividends and one-digit divisors.
- Communicate ideas with key math vocabulary: *division equation.*

Assess

Use the annotated pages to correct *WorkSpace* pages 11 and 12.



Note the progress of each student in the appropriate rows on the tracking chart found on page 142 of this guide.

Reevaluating Student Placement

As you review each student's work from these four lessons and the assessment, you may suspect that a student does not have the foundations he or she needs to be successful in this module. You can use the End-of-Module Assessment from *Do The Math: Division B* to find out if the student has the necessary prerequisite skills. If the student does not score 80% on this assessment, or struggles to complete it, he or she will need additional guidance. Modules A and B address these prerequisite concepts and skills.

Differentiating Instruction

Although the lessons are carefully scaffolded and paced at a rate more likely to give students a chance for optimal learning, there will be instances when students are still struggling and need extra support. Also, there will be instances when students would benefit from additional challenges or practice. Try the teaching ideas below.

For Students Who Need More Support

- If students have difficulty with dividing, provide additional support.
  - Provide students with pennies or other counters.
  - Have students arrange them in equal groups of 2, 3, 4, and 5.
  - Guide students to write each division equation.
- Play *Leftovers* with students to provide additional practice dividing.
  - Game rules can be found in the *Do The Math* digital resources.

For Students Ready for a Challenge

- Have students investigate squadrons of greater numbers, such as 45, 50, 60, and 100.
- Have students play *Division Bingo.*
  - Students may play alone or with a partner.
  - Game rules can be found in the *Do The Math* digital resources.

The Attitude Survey measures students' disposition towards math.

ATTITUDE SURVEY

Name: _____ Date: _____

➤ Fill in the circle of the answer that best fits you.

1. I like math.
- ○ not at all
- ○ a little
- ○ some, but it's not my favorite
- ○ it's my favorite subject

2. I am good at math.
- ○ not at all
- ○ not very good
- ○ fairly good
- ○ very good

3. I need good math skills so I can get a good job when I am older.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

4. I can get better in math if I work hard.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

5. I like solving different problems.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

6. I believe that math problems can often be solved using different strategies.
- ○ agree a lot
- ○ agree a little
- ○ disagree a little
- ○ disagree a lot

➤ Which of these do you agree with? You may choose more than one answer.

7. When math is challenging, I _____.
- ○ take on the challenge.
- ○ give up easily.
- ○ put in a little effort.
- ○ put in a lot of effort.
- ○ ask my teacher for help.

➤ Write an answer to each question.

8. What do you like most about math? Explain.

_____

_____

_____

_____

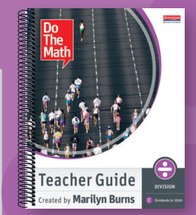
9. What do you like least about math? Explain.

_____

_____

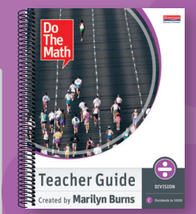
_____

_____



Do The Math
Created by Marilyn Burns

Students complete "Show What You Know" assignments every fifth lesson. These assignments help you monitor student progress and assess understanding of the concepts and skills from the previous four lessons.



Show What You Know

DIRECTIONS

- Write a multiplication equation.
- Write the answer to the division problem.
- Answer the question.

18th Squadron

1 Groups of 2

18 ÷ 2 = 9

9 × 2 = 18

Is 18 divisible by 2? yes

2 Groups of 3

18 ÷ 3 = 6

6 × 3 = 18

Is 18 divisible by 3? yes

3 Groups of 4

18 ÷ 4 = 4 R2

4 × 4 = 16

Is 18 divisible by 4? no

4 Groups of 5

18 ÷ 5 = 3 R3

3 × 5 = 15

Is 18 divisible by 5? no

Home Note: Your child writes multiplication and division equations to solve problems.

Show What You Know

DIRECTIONS

- Write the answer for each equation.

1 5 × 60 = 300	2 2 × 100 = 200
3 3 × 20 = 60	4 6 × 80 = 480
5 4 × 90 = 360	6 1 × 40 = 40
7 5 × 70 = 350	8 6 × 70 = 420

- Fill in the blanks.

9 25 ÷ 8 = 3 R1

dividend 25
divisor 8
quotient 3
remainder 1

10 16 ÷ 3 = 5 R1

dividend 16
divisor 3
quotient 5
remainder 1

Home Note: Your child multiplies by multiples of 10 and divides by one-digit numbers.

Do The Math
Created by Marilyn Burns

DIVISION C

Objectives Tracker

➤ Record the date in the appropriate box as students are assessed on each of the objectives. When the student consistently performs an objective with accuracy, add a checkmark to the box.

☑ MODULE OBJECTIVES	STUDENT NAMES							
Write related multiplication and division equations.								
Calculate the quotients and remainders for two-digit through three-digit numbers divided by one- and two-digit divisors.								
Use the inverse relationship between division and multiplication to solve problems.								
Solve problems for grouping situations.								
Communicate ideas with key math vocabulary: *division equation*, *dividend*, *divisor*, *quotient*, *remainder*, and *divisible*.								

Connecting Home to School: Send home copies of *Do The Math* Community News letters before each group of five lessons to encourage family involvement.

Do The Math

Community News

Notes of interest to the classroom teachers and families of students participating in the *Do The Math* program

DIVISION C Dividends to 1,000 LESSONS 1–5

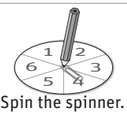
UPDATE: Students listen to a reading of *A Remainder of One*, a book that presents situations that can be represented with division problems. Students solve division problems by writing the related multiplication.

Target 1000

➤ **Here is a game that provides your child practice with multiplying by multiples of 10.**

To play, you will need a 1-6 spinner, a pencil, and paper.

Each player writes 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 on a piece of paper.

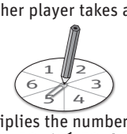
1 
Spin the spinner.

2 Multiply the number on the spinner times 10, 20, 30, 40, ~~50~~, 60, 70, 80, 90, or 100.

$4 \times \underline{50} = 200$

Cross off the number you choose on your list.

3 The other player takes a turn.


The other player multiplies the number on the spinner times 10, 20, 30, 40, 50, ~~60~~, 70, 80, 90, or 100.

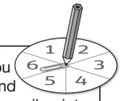
$5 \times \underline{60} = 300$

The player crosses that number off his or her list.

Each player adds his or her new amount to the previous score to keep a running total.

Players take turns. After six turns, the player closest to 1000 wins.

TRY THIS



To use a spinner, you need a paper clip and a pencil. Place the pencil point in the center of the circle and inside the curve of the paper clip. While holding the pencil in place, flick the paper clip with your finger.