

# 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







To see additional Do The Math samplers for Multiplication, Division, and Fractions, please visit http://hein.pub/DoTheMathSamplers

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



### 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

#### SCAFFOLDED CONTENT

#### 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.
- 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.





Connecting cubes represent joining problems.

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.
- Students look closely to discern patterns or structure when solving problems.

### Open number lines help students flexibly add and subtract using benchmark

numbers.





#### 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 use repeated reasoning to identify general methods and shortcuts.



### Instructional Principles (continued)

## Help Students Build Their **Mathematical Reasoning**

#### CLASSROOM ROUTINES

#### INDEPENDENT STUDENT WORK

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



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.

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

- WorkSpace<sup>®</sup> 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.





Specific guidance for how to promote understanding and address student misconceptions is integrated into all lessons.

• A glossary in the *WorkSpace*<sup>®</sup> provides students with a reference for definitions.

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

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.

Explain add, or addend, equal write add and add Say the words and s

Add is what you two or more nur Addition is the add. We can sho We read the eq The sum is the the equation 4 are addends. Write the words a words and have s Math Voca • add addition equation

• plus • addend





#### ASSESSMENT AND DIFFERENTIATION

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

roduce math	
cabulary.	
addition oquation plus	
ils, and sum.	
<i>lition</i> on the <i>Math Vocabulary</i> chart. I have students repeat them.	
ou do to find the total number when umbers are joined or put together. a name for what you do when you now addition with an equation.	
uation this way—4 plus 1 equals 5. number you get when you add. In + 1 = 5, 5 is the sum and 4 and 1	
and draw lines as shown. Say the tudents repeat them.	
abularu	
4+1=5	
4 + 1 = 5	
(4)+(1)= 5	
4+1⊜5	
4+1=(5)	
te the vocabulary and	
nitions.	
py what you wrote on the chart	
the glossary on pages 66–68.	

leacher Guide by Marilyn Bu





## **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.

### 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 kev math vocabulary: add, addend, addition, equals, equation, plus, and sum.

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

Students also revisit Shake and Spill and Race to the Top, now applying these



2 The Benchmark of 5





PLANNER	The Benchmark o	f 5		
	LESSON 1			LE
		Game	Game	
	Making Sums of 5	Finding Addend Pairs That Make 5	Using 5 as a Benchmark	Using the Ben for Sums of 6
	Students use two-color counters to generate pairs of addends that make 5 and then write them as equations with addition.	Students find and list all pairs of addends that make 5 and then play a game to practice making 5.	Students use a ten-frame and the benchmark of 5 to build numbers and find sums to 10.	Students use the benchm sums of 6 to 10.
OBJECTIVES	Identify pairs of addends that make 5.	<ul> <li>Identify all possible pairs of addends that make 5.</li> </ul>	• Identify numbers to 10 using the benchmark of 5.	• Use the benchmark of a of 6 to 10.
MTools In these lessons, you		• Given a number, figure how many more to make 5.		
will use:				
Number cubes     Plastic cup     PURPOSE	Using hands-on manipulatives to represent	Playing a game in pairs to identify	The visual representation of counters on a tap frame focuses students on the barchmarks	Using manipulatives, sur
Ten-frames	helps students connect concrete experiences with the more abstract experience of writing	communication and mathematical language skills among students.	of 5 and 10, thus enabling them to compose, decompose, and add numbers flexibly.	numbers without counting
Learning Online To support teaching these	equations.			
lessons:  View "Teaching Math Verschulder"				
Read <u>"Language of</u> Math."     KEY MATH     VOCABULAI	equation NEW     equation NEW     equation NEW     equation NEW	add equation     addend plus	add      equation     addend     equation	<ul><li>add</li><li>addend</li></ul>
Do Created by	addition NEW     sum NEW     equals NEW	addition     equals	addition     sum     equals	<ul><li>addition</li><li>equals</li></ul>
Math				
MATERIALS	WorkSpace pages 2, 64, and 66–68	WorkSpace pages 2–5	WorkSpace pages 6–7	WorkSpace page 8
Professional Professional for teachers and st	• Plastic cup 73	Plastic cup	• Two-color counters	Two-color counters
Bead the Introduction mTools	Chart paper	• Race to the Top 🕞	Yellow crayon     Bace to the Top With 6 Counters R	<ul> <li>Red number cube </li> <li>Yellow number cube </li> </ul>
Read the Introduction	WorkSpace pages 2, 64, and 66–68     Two-color counters      Plastic cup      Chart paper	<ul> <li>WorkSpace pages 2–5</li> <li>Two-color counters 72</li> <li>Plastic cup 72</li> <li>Race to the Top 6</li> </ul>		<ul> <li>WorkSpace</li> <li>Ten-frame</li> <li>Two-color</li> <li>Red numb</li> <li>Vollow put</li> </ul>







5

Progress Monitoring

#### Assessing Student Understanding

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

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

Assessing with familiar visual models and symbolic representations allows students to show their understanding without having to approach the material in an unfamiliar format.

• add

• addend

addition

equals

equation plus sum

- WorkSpace pages 9-10
- Ten-frame 🎵
- Two-color counters 💯

Planner 5







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

#### **Guide students to** build on from 5.

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

 $\bigcirc$  I will place one more counter on the ten-frame. Place one counter yellow side up on the

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

 $\bigcirc$  Start with 5 and count on one to get 6. I don't have to count the 5 because I know there are 5

Place another counter yellow side up on the

 $\bigcirc$  How many counters are on the ten-frame now? (7) Yes, there are 7 counters. I start with 5 and count

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

 $\bigcirc$  How many counters are on the ten-frame now? (10) Remember we don't need to count one-by-one

> CONTINUE Lesson 3 15











#### **Students write** two equations for sums of 6.

#### • Explain the directions for *WorkSpace*

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

 $\bigcirc$  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.

#### **2** Students complete *WorkSpace* page 6.

r 6		
1		
	. ľ.	
indeel. With an equi	ation With	an equation
to show the c	20.5	Gw Te Kant
tion for Colors	Equation	for Rows
3+3=6	5+1	
4+2=6	5+1	1 = 6
1+5=6	5+1	1 - 6
5+1=6	5+1	1.6
2+4=6	5+1	1.6
n¥15.0		

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

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 Lesson 3 17







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

#### **Students complete** an assessment.

### • Explain the directions for *WorkSpace*

Have students turn to *WorkSpace* page 9. Explain

 $\bigcirc$  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.

#### **2** Students complete *WorkSpace* page 9.

PACE PAGE 9				
You Know	,			
	2			
Equations 1+8=9	8		Equations 1+8=9 5+4=9	
for reds and yellow.		Write an equation	for the rows.	
Equations			Equations	
3+5-8			7+2=9	
5+3-8	0		5+4-9	
2+5=7			6+3=9	
5+2=7	۲		5+4-9	
4+5-9			2+4-6	
5+4-9	0		5+1=6	
1+5-6			8+1-9	
5+1-6	8		5+4-9	
3+6-9			4+4-8	
5+4-9	0		5+3-8	
2+6-8			2+7=9	
5+3-8	0		5+4-9	J
n ult une trà			Lenna 1	9

 $\bigcirc$  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.

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

AFTER THE LESSON

Lesson 5 23





#### LESSON 5 Assessing Student Understanding

#### ✓ Progress Monitoring ASSESSMENT

#### **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.



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 lessonsfinding pairs of addends that make 10.







2

Write an equation for reds and yellows.





24 The Benchmark of 5







Write an equation for the rows.

	Equations	
	7 + 2 = 9	
	5 + 4 = 9	
	6 + 3 = 9	
	5 + 4 = 9	
	2 + 4 = 6	
	5 + 1 = 6	
	8 + 1 = 9	
	5 + 4 = 9	
	4 + 4 = 8	
	5 + 3 = 8	
	2 + 7 = 9	
	5 + 4 = 9	
	Lesson 5 9	)



Call 800.225.5800 or visit Heinemann.com/DoTheMath

## **NEW** From Heinemann Math



## By Marilyn Burns and Lynne Zolli

A K–5 Digital Interview Tool to help teachers learn how their students reason numerically—information that's essential for planning instruction. LISTENINGTOLEARN.COM



Houghton Mifflin Harcourt™, Do The Math®, WorkSpace®, and Math Solutions® are trademarks or registered trademarks of Houghton Mifflin Harcourt. © Heinemann. All rights reserved. Printed in the U.S.A.

Heinemann.com/DoTheMath



6/21