

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



Overview

> Introduction to Do The Math

An Introduction From Marilyn Burnsiv	
Instructional Principlesvi	
Division C Materials	
Division C at a Glance	
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> The Lessons

PAGE

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LESSONS 1-5

Write Division

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





LESSONS 11-15



dividends.

 $\begin{array}{c} 6 \\ 10 \\ 10 \\ 4 \\ 65 \\ \frac{40}{25} \\ 24 \\ 25 \\ 24 \\ 1 \end{array}$ (6 x 4 = 24

00 00 01 00 03 90 00 00 00



PAGE

69

Divide Three-Digit Dividends Students solve division problems with three-digit dividends and one-digit



divisors.



> Additional Resources

Attitude Survey	
Objectives Tracker	
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Instructional Principles

Help At-Risk and Struggling Students **Succeed in Math**

Tiles represent the

objects into equal

groups

division of concrete

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.

JIVISION MODELS



Pennies and dimes are divided by 10 to model grouping problems



Number cubes generate random numbers in division dames.



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.



Feacher Guide ted by Marilyn Bur



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.



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.

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.

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.



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.





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

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

troduce ma 1 Introduce the lesson

⊃ Today we'll solve some mor

Present the context of the probl er of One. Why was Jo-





Teacher Guide ted by Marilyn Burn





In Lessons 1–5.

Write related multiplication

· Calculate the quotients and remainders for two-digit

dividends and one-digit

• Multiply one-digit numbers

by multiples of 10 from 10

Communicate ideas with

division equation, dividend, divisor, quotient, remainder,

kev math vocabulary:

and divisible.

2

and division equations.

students...

divisors.

to 100.

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.

 $25 \div 4 = 6$ R1 dividend divisor quotient remainder

XXXXXX $\begin{array}{c} x \quad \begin{array}{c} xxxxxxx \\ xxxxxxx \end{array} \longrightarrow \\ \end{array}$ XXXXXX 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 $4 \times 50 = 200$ 200 $5 \times 60 = 300$ 500 $1 \times 100 = 100$ 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.

MarlyObs



Write Division Equations









Lessons

1–5

100

200

Add the answer to the multiplication problem to your previous score.

90



PLANN	IER				
					LESSON C
		Writing Division Equations	Solving Division Problems	Figuring Out the Divisibility of Two-Digit Numbers	Learning <i>Target 1000</i> , a Multiplication Game
		Students write division equations and learn division vocabulary in the context of a story.	Students investigate whether 24 and 30 are divisible by 2, 3, 4, or 5 in the context of a story.	Students determine whether other numbers are divisible by 2, 3, 4, or 5.	Students play <i>Target 1000</i> , a game that provides practice multiplying by multiples o to 100, an essential skill for division.
mTools hese lessons, you use: Number cubes	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 o 10 from 10 to 100.
ressional pring Online pport teaching these ns: w "Using Children's rature to Teach th."	PURPOSE	The illustrations in <i>A Remainder of One</i> 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 practic communicating mathematical ideas while th practice multiplying by multiples of 10.
eto Teach Math."	KEY MATH VOCABULARY	 dividend NEW division equation NEW divisor NEW quotient NEW remainder NEW 	dividend idivisible NEW equation divisor idivisor equation quotient	divisible division equation multiplication equation remainder	multiplytimes
Professional Learning Guide e Introduction to h	MATERIALS Physical manipulatives are also available as digital tools for teachers and students. mTools	 <i>WorkSpace</i> pages 2, 71, and 77–79 Chart paper <i>A Remainder of One</i>, 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 2 Target 1000 2





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 Exclusive organize are divisible division equation eccación de division multiplication equation eccación de division multiplication eccación de division multiplication eccación de division multiplication eccación de multiplicación remainder construction division division equation eccación de multiplicación remainder construction division eccación de division multiplication equation eccación de division eccación de multiplicación remainder constructions de division eccación de multiplicación remainder construction division eccación de multiplicación eccación de multiplicación eccación de multiplicación remainder construction eccación de multiplicación eccación de division eccación de multiplicación eccación de division eccación de division eccación de division eccación de division eccación de multiplicación eccación de multiplicación eccación de division ecc	TEP2 Students solve division problems. Present the problem. Students turn to WorkSpace page 5. WORKSPACE PAGE 5 Students pages 6 a
 WorkSpace pages 4-7 Have students turn to WorkSpace page 4. 	
Choose students to read one set of division and multiplication equations each. Record the equations on the board.	 If the intervent of the second second
$30 \div 2 = 15 \qquad 15 \times 2 = 30$ $30 \div 3 = 10 \qquad 10 \times 3 = 30$ $30 \div 4 = 7 R2 \qquad 7 \times 4 = 28$ $30 \div 5 = 6 \qquad 6 \times 5 = 30$ Mhich of these numbers is 30 divisible by? (2, 3, and 5) How do you know? (The division equations have no remainders.)	Have students think, pair, share. Choose a student to report. Record the equations on the board and have students check their equations on <i>WorkSpace</i> page 5. $32 \div 2 = \underline{16} \qquad \underline{16} \times 2 = 32$ \bigcirc So, 32 is divisible by 2.



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



s complete *WorkSpace* page 5. nts complete the page.

s complete *WorkSpace* and 7.



t of these assignments is to reinforce for how thinking about multiplication can be solving division problems. Limiting these to divisors of 2, 3, 4, and 5 with dividends nakes the numbers accessible and keeps focus on using the connection between d multiplication.

STOP Lesson 3 15







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

Students play a game.

• Students play *Target 1000*.

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

SPACE	PAGE	E 13		
000				
30 40 2 30 40 2 30 50 Choose a term in Cross it off the	50° 60	70 80 uttor 0 = 200 ttiply. requitien.	90 100	
30 40	50 60	70 80	90 100	
			TOTAL:	



AFTER THE LESSON

Lesson 5 21



The Attitude Survey measures students' disposition towards math.

LESSON (5) Assessing Student Understanding

Progress Monitoring ASSESSMENT

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.

 Write a multiplication equation. Write the ansate to the division peak Assume the question. 	-	> Write the assume for each equality	•
18th Squadron	~	③ 5 × 60 =	2 × 100 =
() Grange of 2	() Emopoid 3	③ 3 × 20 =	@ 6 × 80 =
18 + 2 = <u>9</u> 9 × 2 = 18	18 + 3 = <u>6</u> 6 × 3 = 18	Ø 4 × 90 - 20	@ 1 × 40 - 4
ta 18 divisible by 21 <u>1983</u>	to 28 divisible by 37 1983	0	0 6 × 70 - 40
() trape of t	Consecut 5	U 5 × /0 =	0 6 x /0 =
$18 + 4 = \frac{482}{10}$	18 + 5 = <u>383</u>		
)
ts 18 divisible by 47	In 28 divisible by 57	① 25 + 8 = 3 RI	16 + 3 = 5 R1
			distant 16
			quatient 3

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.

ATTITUDE SURVEY

Name:

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

1. I like math.	6. I believ be solv
() a little) ag
○ some, but it's not my favorite	
○ it's my favorite subject	
2. Lam good at math	
\bigcirc not at all	> Which
	You ma
	7 When n
	\bigcirc tak
🔾 very good	⊖ cu: ⊖ giv
3. I need good math skills so I can get	
a good job when I am older.	O pu
🔿 agree a lot	O pu
○ agree a little	() asl
⊖ disagree a little	► Write a
\bigcirc disagree a lot	<mark>8.</mark> What d
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.	9. What d
⊖ agree a lot	
🔿 agree a little	
🔿 disagree a little	
🔿 disagree a lot	

22 Write Division Equations

Date

ve that math problems can often ed using different strategies.

- ree a lot
- ree a little
- sagree a little
- sagree a lot

of these do you agree with? ay choose more than one answer.

nath is challenging, I

- ke on the challenge.
- ve up easily.
- ut in a little effort.
- ut in a lot of effort.
- sk my teacher for help.

an answer to each question.

to you like most about math? Explain.

to 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 > Write a multiplication equation. > Write the answer to the division problem. > Answer the question. 18th Squadron Groups of 2 2 Groups of 3 $18 \div 2 = 9$ $18 \div 3 = 6$ $9 \times 2 = 18$ $6 \times 3 = 18$ Is 18 divisible by 2? <u>Yes</u> Is 18 divisible by 3? <u>Yes</u> (4) Groups of 5 **3** Groups of 4 $18 \div 4 = 4R2$ $18 \div 5 = 3R3$ $4 \times 4 = 16$ $3 \times 5 = 15$ Is 18 divisible by 4? <u>NO</u> Is 18 divisible by 5? <u>10</u>

11

Lesson 5

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

Show What You Know	N
DIRECTIONS	
> Write the answer for each equation.	
(1) $5 \times 60 = 300$	2 × 100
$3 \times 20 = 60$	(4) 6 × 80 =
(5) 4 × 90 = <u>360</u>	6 1 × 40 =
$7 5 \times 70 = 350$	⑧ 6 × 70 =
Fill in the blanks.	
(9) $25 \div 8 = 3 \text{ R1}$	10 16 ÷ 3 = 5
dividend <u>25</u>	dividend
divisor <u>8</u>	divisor
remainder <u>1</u>	remainder
2 Lesson 5 Aome Note: Your child multiplies by m	ultiples of 10 and divides by one-d









DI/	'IS	ΠO	N	((
				-												_					_	 	_		 	1

Objectives Tracker

142

> 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.					

Community News Dn **A** Math Notes of interest to the classroom teachers and families of students participating in the Do The Math program DIVISION (C) LESSONS 1-5 Dividends to 1,000

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

202

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Ξ

- > 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.

	$6 \frac{1}{5} \frac{2}{3}$ Spin the spinner.
2	
2	Multiply the number on the spinner times 10, 20, 30, 40, 50, 60, 70, 80, 90, or 100.
	4 × <u>50</u> = 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 × <u>60</u> = 300
	The player crosses that number off his or her list.
Ea ke	ch player adds his or her new amount to the previous score ep a running total.
DI	avers take turns. After six turns, the player closest to 1000 wi





TRY THIS To use a spinner, you (6 5 4 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. Ζ 3 6 4 143



