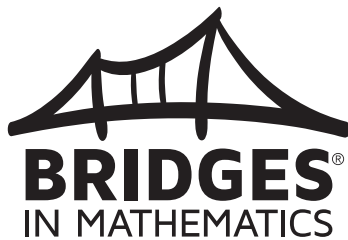


Teachers Guide

GRADE 3 – UNIT 5 – MODULE 3

Preview



Module 3

Division Practice

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Session 3 Line 'Em Up	13
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Teacher Masters

Pages renumber with each module.

Sharing & Grouping Forum Planner	T1
Two Different Ways to Look at an Array	T2
Introducing Line 'Em Up	T3
Work Place Guide 5C Line 'Em Up	T4
Line 'Em Up Record Sheet	T5
Introducing Division Capture.....	T6
Work Place Guide 5D Division Capture	T7
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Student Book Pages

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Module 3

Division Practice

Overview

During Module 3, students again investigate two different interpretations of division—sharing and grouping—by solving story problems that elicit one interpretation or the other, and then sharing and discussing their work as a class. The teacher also introduces two new division Work Places, Line 'Em Up and Division Capture. The first of these is designed to deepen students' understandings of the operation, while the second provides practice with basic division facts.

Planner

Session & Work Places Introduced	P&I	MF	WP	A	HC	DP
<p>Session 1 Sharing & Grouping Problems</p> <p>In today's session, students first pose story problems that match related multiplication and division expressions, and then work in pairs to solve a set of division story problems. This set features three pairs of division problems that involve the same numbers, but elicit two different interpretations of division—sharing and grouping. The teacher circulates to observe, provide support and challenge, and select students to share the work next session during a math forum.</p>	●				●	●
<p>Session 2 Sharing & Grouping Forum</p> <p>Today's session opens with a math forum, during which selected students share their thinking with the class about the problems they solved last session. During the forum, students continue to investigate and discuss the sharing and grouping interpretations of division. After the forum, they complete a related assignment in their Student Books, and go to Work Places as they finish.</p>		●	●			●
<p>Session 3 Line 'Em Up</p> <p>Today, the teacher plays a new game with the class, introduces it as a Work Place, and then sends students out to do Work Places. The game of Line 'Em Up reinforces the use of an array model for division, provides an opportunity for students to deepen their understanding of the operation, and produces interesting patterns that will engage even those students who are already proficient with division.</p> <p>Work Place 5C Line 'Em Up</p> <p>Each player rolls two dice, multiplies the two numbers, and then divides that number of bugs (modeled with tiles) into 2, 3, 4, 5, and finally 6 rows. Players record the results of each division, including any remainders. At the end of the game, both players add up their remainders and the player with the greater sum wins.</p>	●		●		●	●
<p>Session 4 Division Capture</p> <p>Today, the teacher plays another new game with the class, introduces it as a Work Place, and then sends students out to do Work Places. Division Capture provides practice with basic division facts in the context of an engaging game that involves strategy as well as luck.</p> <p>Work Place 5D Division Capture</p> <p>Players take turns spinning a number to complete a division combination on a grid. Each player uses a different color, and once all equations are completed, they circle their own equations that fall in a row to score points.</p>	●		●			●

P&I – Problems & Investigations, **MF** – Math Forum, **WP** – Work Place, **A** – Assessment, **DP** – Daily Practice, **HC** – Home Connection

Materials Preparation

Each session includes a complete list of the materials you'll need to conduct the session, as well as notes about any preparation you'll need to do in advance. If you would like to prepare materials ahead of time for the entire module, you can use this to-do list.

Task		Done
Copies	Run copies of Teacher Masters T1–T12 according to the instructions at the top of each master.	
	Run a single display copy of Student Book pages 163 and 166.	
	If students do not have their own Student Books, run a class set of Student Book pages 163–174.	
	If students do not have their own Home Connections books, run a class set of the assignments for this module using pages 91–94 in the Home Connections Book.	
Work Place Preparation	Prepare the materials for Work Places 5C & 5D using the lists of materials on the Work Place Guides (Teacher Masters T4 & T7).	
Special Items	If possible, get a copy of <i>One Hundred Hungry Ants</i> by Elinor J. Pinczes to read to your class in Session 3. The book is included in the Grade 2 Bridges kit.	



Additional Resources

Please see this module's Resources section of the Bridges Educator site for a collection of resources you can use with students to supplement your instruction.

Preview

Session 1

Sharing & Grouping Problems

Summary

In today's session, students first pose story problems that match related multiplication and division expressions, and then work in pairs to solve a set of division story problems. This set features three pairs of division problems that involve the same numbers but elicit two different interpretations of division—sharing and grouping. The teacher circulates to observe, provide support and challenge, and select students to share the work next session during a math forum. At the end of the session, the teacher introduces and assigns the More Number Puzzles Home Connection.

Skills & Concepts

- Interpret quotients of whole numbers; write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Solve for the unknown in a division equation involving 3 whole numbers (3.OA.4)
- Fluently divide with dividends to 100 using strategies (3.OA.7)
- Solve two-step story problems using multiplication and division (3.OA.8)
- Write equations with a letter standing for the unknown quantity to represent two-step story problems (3.OA.8)
- Construct viable arguments and critique the reasoning of others (MP.3)
- Model with mathematics (MP.4)

Materials

Copies	Kit Materials	Classroom Materials
Problems & Investigations Sharing & Grouping Problems		
TM T1 Sharing & Grouping Forum Planner SB 163*–164 More Story Problems	<ul style="list-style-type: none"> • colored tiles • red linear pieces • magnetic tiles • Magic Wall 	<ul style="list-style-type: none"> • student math journals • piece of paper to mask portions of the Student Book page • class guidelines for writing and answering story problems (from Module 1, Sessions 5 and 6; see Preparation)
Home Connection		
HC 91–92 More Number Puzzles		
Daily Practice		
SB 165 Division Practice		

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

* Run 1 copy of this page for display.

Vocabulary

An asterisk [*] indicates those terms for which Word Resource Cards are available.

array*
 column
 dividend*
 division
 divisor*
 group
 quotient*
 row
 share

Preparation

- Organize your colored tiles and red linear units so each student pair has easy access to these materials. You will need a set of tiles and linear units for display as well. If you want to display tile arrangements on the whiteboard or Magic Wall, you can use the foam magnetic tiles from your kit and draw the linear units around them.
- Be sure the guidelines for writing and answering story problems that students established in Module 1, Sessions 5 and 6 are displayed where everyone can see them.
- Read Session 2 to see how students might share their work from today's session. Before tomorrow's forum, use the Sharing & Grouping Forum Planner to help select students to share their work.

Guidelines for Writing Story Problems

1. Make an interesting, challenging problem.
 - More than one step.
 - More than one operation.
 - Division with grouping.
 - Extraneous information.
2. Don't give away the answer.
3. Use factors between 3 and 15.
4. Products or dividends should be under 125.
5. Give the reader enough information to solve your problem.

Remember: If it takes less than a minute to solve, it's probably too easy. If you can't solve it yourself, it's too hard.

Writing Good Story Problem Answers

- Show your thinking step by step. Tell people what you did first, then second, then third, etc.
- You can use pictures, numbers, or words to show your work. You need to use at least 2 of these ways to be clear.
- Use equations to show how you solved the problem. Be sure to use the right symbols ($+$, $-$, $=$, \times , \div).
- If you draw pictures, be sure to label them so everyone knows what they mean. Also be sure to make them neat and use the same symbol for each thing.
- Use neat handwriting, and don't forget your name.



Problems & Investigations

Sharing & Grouping Problems

- 1 Set the stage for the session by letting students know that they're going to write a couple of story problems and then work in pairs to solve some more story problems today.
Have them get out their math journals in preparation for today's problem solving. Ask them to find the next available page, date it, and write the title *More Story Problems* at the top.
- 2 Display your copy of the More Story Problems Student Book page. Show only the first problem, keeping the rest of the sheet covered for now.

Unit 5 Module 3 | Session 1

NAME _____ | DATE _____

More Story Problems page 1 of 2

1 Write your own story problem to fit this equation: $7 \times 5 = m$

- 3 Read problem 1 out loud with the class. Then invite volunteers to explain the meaning of 7×5 , and have the class brainstorm some story problems based on the meanings shared.

Teacher What does 7 times 5 mean?

Students Seven groups of 5.

Or you could have a 7-by-5 rectangle.

Seven jumps of 5 on a number line.

Seven times longer than Chloe, if Chloe is 5 units long.

Teacher How might you use one of those interpretations to pose a story problem that matches $7 \times 5 = m$?

Students There are 7 trees. Each tree has 5 monkeys. How many monkeys are there?

I have 7 five-dollar bills in my bank at home. How much money in all?

I put some tiles into a rectangle. I made 5 rows of 7. How many tiles did I use?

- 4 Give students a couple of minutes to write a story problem that matches $7 \times 5 = m$ in their journals.

- As they finish writing, have them share and compare their problems with the people sitting nearest them.
- Confirm with the class that the value of m in this equation is 35.

- 5 Reveal the second problem on your copy of the Student Book page, and repeat steps 3 and 4.

Item 2 asks students to write a story problem that matches the equation $35 \div 5 = n$. As you did with item 1, invite volunteers to explain the meaning of $35 \div 5$. Have the class brainstorm a few story problems together, and then give the students a couple of minutes to write and share story problems to match.

As you work with the students, press them to explain the relationship between the first equation, $7 \times 5 = m$, and the second equation, $35 \div 5 = n$. What do these two statements have to do with each other?

- 6 Now reveal the rest of the problems on the More Story Problems page, and have students find the page in their own books. Give them a minute to look over the problems on the page. Then explain the assignment, and help the students organize themselves and the materials they'll need.

- Assign student pairs or have them choose their own partners.
- Make sure all the students have access to colored tiles and linear pieces. Explain that they can use the tiles and linear pieces in any way they find most helpful, but they're not required to use either.
- Have both students in each pair record their work in their own journals. Remind them to use numbers, labeled sketches, or words to show their thinking, with the goal of following the communication guidelines they established before they started solving each other's Game Store problems a few days ago.
- Let students know that they will share their work in a math forum next session.

- 7 When the students understand what to do, have them get started.

- 8 As students work, take time to offer support as needed. Circulate around the room, and use your copy of the Sharing & Grouping Forum Planner to make notes about who you'll have share in tomorrow's math forum.

- Take time to confer with students as necessary, especially those in need of support or challenge.
- As you work with students, remind them to write an equation to match each problem once they've solved it.
- You can vary your expectations as needed, in terms of how many of the problems each student pair solves, but most should be able to get through the entire set, excluding the challenge problem at the end.

SUPPORT/ELL If you have students who are struggling to understand the questions, read the problems with them and help them decipher what they're being asked to do.

SUPPORT Encourage students who know what the question is asking but are using counting by 1s to model and solve the problem to work in larger chunks. For example, if a student is in the process of making 6 piles and is dealing out the tiles one by one, ask her if she can deal out two or three at a time instead.

CHALLENGE Ask students who are easily using the tiles to model and solve these problems to build a tile array for one of the pairs of problems, and use it to show how and where the answer to both problems can be seen in the same array.

Teacher I see that you and Shana have solved problems 5 and 6 already. What did you get for your answers to those problems?

- 5** Steve baked 36 cookies. He put 4 cookies in each bag. How many bags of cookies did he have?
- 6** Craig gave his sister 4 boxes of new markers. She was happy to get 36 new markers. How many markers were in each box, if each box held exactly the same number of markers?

Katelyn We got 9 for both of them.

Teacher Does the 9 mean the same thing for both problems?

Shana Well, no—it's about cookies on problem 5, and markers on the other problem.

Teacher Tell me more about what the 9 means in both of those problems.

Katelyn For problem 5, it means that he can make 9 bags of cookies if he starts with 36 and puts 4 in each bag. And for problem 6, it means that each box has 9 markers.

Teacher Can you tell me what you did with the tiles to get both answers?

Shana On the cookies one, we pretended like the tiles were cookies. We got 36 of them and made groups of 4 until we couldn't make any more. It was 9 groups because 4×9 is 36.

Katelyn And on the other one, we got 36 tiles and divided them into 4 groups for the 4 boxes of markers. Each box got 9 of them.

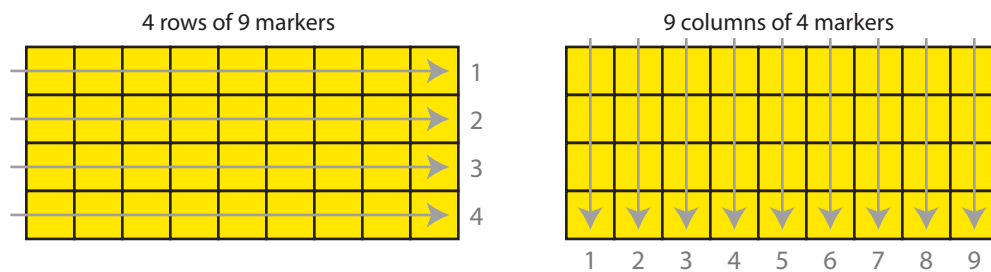
Teacher I see that you still have the sets of 9 tiles laid out for the markers problem. What happens if you push those tile together into a 4-by-9 array? Try it, and then come get me. I'm curious to see if you can see the answer to both of the problems in the same array.

Shana Ms. Fernandez, come look! We did what you said.

Teacher What did you find out?

Katelyn If you make the tiles into an array, you can see the 4 boxes of markers going across.

Shana And if you look up and down, you can see the 9 bags of cookies!



Teacher That's interesting, isn't it? Would you be willing to share your discovery in our math forum tomorrow?

Katelyn Sure!

CHALLENGE Invite students who are dealing with basic multiplication and division easily to solve the challenge problem at the bottom of the page.

9 Close the session.

- Have students clean up and put their materials away.
- Remind them that they will have a chance to share some of the strategies they used to solve today's story problems next session.



Home Connection

10 Introduce and assign the More Number Puzzles Home Connection, which provides more practice with the following skills:

- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)
- Identify equations with a letter standing for the unknown quantity to represent two-step story problems (3.OA.8)



Daily Practice

The optional Division Practice Student Book page provides additional opportunities to apply the following skills:

- Solve division story problems with dividends to 100 involving situations of equal groups (3.OA.2)
- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)
- Fluently add and subtract with sums and to 1,000 (3.NBT.2)

Preview

Session 2

Sharing & Grouping Forum

Summary

Today's session opens with a math forum, during which selected students share their thinking with the class about the problems they solved last session. During the forum, students continue to investigate and discuss the sharing and grouping interpretations of division. After the forum, they complete a related assignment in their Student Books and go to Work Places as they finish.

Skills & Concepts

- Interpret quotients of whole numbers; write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Fluently divide with dividends to 100 using strategies (3.OA.7)
- Solve two-step story problems using multiplication and division (3.OA.8)
- Construct viable arguments and critique the reasoning of others (MP.3)
- Model with mathematics (MP.4)

Materials

Copies	Kit Materials	Classroom Materials
Math Forum Sharing & Grouping Forum		
TM T3 Two Different Ways to Look at an Array SB 166*–167 More Arrays	<ul style="list-style-type: none"> • colored tiles • red linear pieces • magnetic tiles • Magic Wall 	<ul style="list-style-type: none"> • More Story Problems Student Book pages (from Session 1) • student math journals with work on More Story Problems (from Session 1) • Sharing & Grouping Forum Planner (TM T1, completed during and after Session 1) • piece of copy paper to mask portions of the teacher master
Work Places in Use		
4A Tic-Tac-Tock (introduced in Unit 4, Module 1, Session 2) 4B Measurement Scavenger Hunt (introduced in Unit 4, Module 2, Session 2) 4C Target One Thousand (introduced in Unit 4, Module 2, Session 3) 4D Hexagon Spin & Fill (introduced in Unit 4, Module 3, Session 3) 5A Solving Game Store Problems (introduced in Unit 5, Module 1, Session 6) 5B Scout Them Out (introduced in Unit 5, Module 2, Session 2)		
Daily Practice		
SB 168 Mixed Operations & Story Problems		

HC – Home Connection, SB – Student Book, TM – Teacher Master

Copy instructions are located at the top of each teacher master.

* Run 1 copy of this page for display.

Preparation

- Write a list of Work Places from which students can choose today. You can just write the numbers (4A–5B) or write out the full names if you prefer. (See the Work Places in Use row of the Materials Chart for the complete list of Work Places in use today.)
- Have some colored tiles and linear pieces (or magnetic tiles and the Magic Wall, if needed) available for students to use to show their thinking during today's forum.



Math Forum

Sharing & Grouping Forum

1 Set the stage for today's session.

- Let students know that you're going to start with a math forum in which some of them will present the strategies they used for solving the story problems from the previous session, and then continue on to have them complete a related assignment in their books. Then they will spend the rest of the session at Work Places.
- Display a copy of the More Story Problems Teacher Master from last session. Have students get out their math journals, find their work from the previous session, and take a minute to quietly review their strategies and solutions for problems 3 and 4.

2 Once students have had a minute or two to reflect on their work from the previous session, start the forum, inviting those students you preselected to present their work one pair at a time.

For each pair:

- Invite the students to present their work.
- After they have finished, ask the other students if they understood what the student did and whether anyone else used the same or similar approach.
- If a student shares something similar that elevates the level of discussion, model what that student did with sketches, numbers, and words.
- Invite the rest of the class to ask questions, and have the presenters respond to those questions.

3 During the forum, use students' thinking as a way to reinforce the fact that there are two different ways of thinking about division—sharing and grouping.

Listen carefully to students' presentations so you can use their thinking as a point of entry for noting with them that although the equations that emerge from each pair of problems (3–4, 5–6, and 7–8) are the same, each problem in the pair has a different feel. In problems 3, 6, and 8, the *number* of groups is known; what has to be determined is the *size* of each group. For example, in problem 3, we know that there are 6 tables and 24 students. We know how many groups the teacher has to divide her students into. Our job is to find out how many there will be in each group. In problems 4, 5, and 7, the *size* of each group is known; what has to be determined is the *number* of groups. For example, in problem 4, we know that Teresa's sticker book holds 6 stickers on each page. Our job is to find out how many pages of 6 she can make with 24 stickers.

Again, your third graders do not need to be able to articulate the differences between the sharing and grouping interpretations of division or identify by name which interpretation is elicited by each problem. They do need to have many opportunities to solve both types of division problems, however, and they will be able to sense the differences if you invite them to do so. It is imperative that you understand both interpretations of division so you can guide students as they begin to develop intuitive understandings.

4 After the preselected students have shared, extend student thinking by inviting students to examine an array related to the third and fourth problems in the set they just discussed.

- Display the top portion of the Two Different Ways to Look at an Array Teacher Master, and give students a minute to quietly examine the two arrays.
- Then have them share observations, first in pairs and then as a whole class. What do they notice about these arrays, aside from the fact that they're the same?

Students They're exactly the same!

They both have 4 across and 6 down.

They're both 6-by-rectangles.

There's 24 little squares in both of them. I know because 4 and 4 is 8, then 8 more is 16, and 8 more is 24.

I agree with you, but I looked at the 6s. I did 6 and 6 is 12, then 12 and 12 is 24.

Teacher I'm curious... did anyone use multiplication to find the total number of tiles in each array?

Marcus I did. I knew it was 6 rows of 4, and 6 times 4 is 24.

George I did it the other way. I saw 4 columns of 6, and I know that 4×6 is 24.

Teacher It works both ways, doesn't it?

- 5 When students have had an opportunity to share their observations about the arrays at the top of the teacher master, mask the right side of the page, reveal the entire left side, and work with input from the class to label the array and answer the questions.
 - Read the story problem below the array with the class and work with students' input to label the array to show:
 - » The number of students (the dividend, 24)
 - » The number of tables (the divisor, 6)
 - » The number of students at each table (the quotient, 4)
 - Then have students help you write an equation to match the problem and identify whether the answer indicates the *size of each group* (sharing interpretation of division) or the *number of groups* (grouping interpretation of each group).
- 6 Reveal the right side of the master, and repeat the actions outlined in step 5. When you are finished, the page will probably look something like this.

Unit 5 Module 3 | Session 2 | 1 copy for display

Two Different Ways to Look at an Array

4 in each row
for the students
at each table

24 tiles for the
24 students

4 columns,
1 for each page
of 6 stickers

6 + 6 + 6 + 6 = 24
24 tiles for the
24 stickers

1 Ms. Rowan has 6 tables in her classroom, and 24 students. If she divides the students evenly among the tables, how many students will sit at each table?

a Equation:
 $24 \div 6 = 4$

b The answer to this problem tells

How many in each group

How many groups

2 Teresa has 24 stickers in her sticker book. Each page holds 6 stickers. How many pages does her sticker book have?

a Equation:
 $24 \div 6 = 4$

b The answer to this problem tells

How many in each group

How many groups

- 7 Now display a copy of the More Arrays Student Book page, which asks students to analyze matching arrays for story problem pairs 5–6 and 7–8.
- Read the instructions at the top of the page with the students and clarify as needed.
 - When students understand what to do, have them go to work.
 - Circulate as they are working to provide support as needed.
 - Encourage students to share and compare their thinking with one another as they work.

SUPPORT Work the first half of the Student Book page, or even the entire sheet, with the students. Or, give students the choice of working with you or working independently.



Work Places

- 8 As students finish the assignment, have them get their folders and go to Work Places.
- 9 Close the session by reviewing the mathematics learned today.
- Tell students that you appreciate the exchange of ideas in the math forum.
 - Ask students to think of one thing they learned in the forum and how it will affect the way they solve division problems in the future.



Daily Practice

The optional Mixed Operations & Story Problems Student Book page provides additional opportunities to apply the following skills:

- Write story problems or describe problem situations to match a multiplication expression or equation (3.OA.1)
- Write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Solve division story problems with dividends to 100 involving situations of equal groups (3.OA.2)
- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Fluently add with sums to 1,000 and subtract with minuends to 1,000 (3.NBT.2)

Session 3

Line 'Em Up

Summary

Today, the teacher plays a new game with the class, introduces it as a Work Place, and then sends students out to do Work Places. The game of Line 'Em Up reinforces the use of an array model for division, provides an opportunity for students to deepen their understanding of the operation, and produces interesting patterns that will engage even those students who are already proficient with division. At the end of the session, the teacher introduces and assigns the More Division Practice Home Connection.

Skills & Concepts

- Interpret quotients of whole numbers; write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Solve division story problems with dividends to 100 involving situations of equal groups and arrays (3.OA.3)
- Model with mathematics (3.MP.4)
- Look for and express regularity in repeated reasoning (3.MP.8)

Materials

Copies	Kit Materials	Classroom Materials
Problems & Investigations Line 'Em Up		
TM T3 Introducing Line 'Em Up	<ul style="list-style-type: none"> • 2 dice, one numbered 1–6 and one numbered 4–9 • colored tiles (class set, see Preparation) • red linear units (class set, see Preparation) 	<ul style="list-style-type: none"> • <i>One Hundred Hungry Ants</i> by Elinor J. Pinczes (optional, see Preparation)
Work Places Introducing Work Place 5C Line 'Em Up		
TM T4 Work Place Guide 5C Line 'Em Up TM T5 5C Line 'Em Up Record Sheet SB 169–170* Work Place Instructions 5C Line 'Em Up		
Work Places in Use		
4B Measurement Scavenger Hunt (introduced in Unit 4, Module 2, Session 2) 4C Target 1,000 (introduced in Unit 4, Module 2, Session 3) 4D Hexagon Spin & Fill (introduced in Unit 4, Module 3, Session 3) 5A Solving Game Store Problems (introduced in Unit 5, Module 1, Session 6) 5B Scout Them Out (introduced in Unit 5, Module 2, Session 2) 5C Line 'Em Up (introduced in this session)		
Home Connection		
HC 93–94 More Division Practice		
Daily Practice		
SB 171 Multiplication Review		

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master

Copy instructions are located at the top of each teacher master.

**Run 1 copy of these pages for use by the teacher and other adult helpers during Work Place time.*

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

array*
divide*
equation*
expression*
multiply*
product*
quotient*
remainder*

Preparation

- If you can borrow a copy of *One Hundred Hungry Ants*, by Elinor J. Pinczes, from your school library (or from one of the second grade teachers in your building), you might want to read it to your class before conducting this session. This is optional, and some of the students might remember hearing the story read in conjunction with one of the Bridges sessions last year. Nevertheless, it's a short, whimsical treatment of division, and a story most children enjoy hearing more than once.
- Organize your colored tiles and red linear pieces so each student pair has access to at least 80 tiles and 6 linear pieces.
- In today's session, you'll introduce Work Place 5C Line 'Em Up, which replaces 4A Tic-Tac-Tock. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 5C, using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.
- Write a list of Work Places from which students can choose today. You can just write the numbers (4B–5C) or write out the full names if you prefer. (See the Work Places in Use row of the Materials Chart for the complete list of Work Places in use today.)



Problems & Investigations

Line 'Em Up

- 1 Set the stage for the session by letting students know that you're going to play a new game with them called Line 'Em Up.
 - Explain that the game will give them more practice with division.
 - Let them know that Line 'Em Up will become a Work Place, available for them to use today when they go out to Work Places later in the session.

- 2 Give students a brief synopsis of *One Hundred Hungry Ants*, by Elinor J. Pinczes, and let them know that this story, along with another of Pinczes' books called *A Remainder of One*, inspired the game of Line 'Em Up.

If you were able to find a copy of the book and read it to your students before this session, you'll be able to give a synopsis of the story with their help. If not, you can read the synopsis below to your class.

One hundred hungry ants are off to sample the delicious food they can smell from a nearby picnic. Since there are 100 of them in a line, they are moving very slowly, and the littlest of them is worried that they might miss the goodies if they don't hurry up.

The littlest ant has a plan, though. He suggests they split into 2 lines of ____ (have students supply the answer) so they can get there more quickly.

When that doesn't seem fast enough, he suggests they split into 4 lines of ____ (have students supply the answer).

Even then, they're moving too slowly, so the littlest ant suggests they split into 10 lines of ____ (have students supply the answer).

By the time they finally get to the picnic, the food is all gone, but the ants have learned that dividing themselves into 2 or more lines is a good way to get somewhere more quickly.

- 3 Now explain that in the game of Line 'Em Up, you're going to take turns with the class rolling two dice, multiplying the numbers that come up, and then dividing the product by 2, 3, 4, 5, and 6 to see what happens.

Before you start, assign student pairs or have them choose their own partners. Each pair will need 80 or more colored tiles and 6 red linear pieces to play the game.

- 4 Have the class take the first turn.

- Ask a volunteer to roll the two dice and report the numbers to the class.
- Record an expression to match in the large box at the top of the students' side of the Introducing Line 'Em Up Teacher Master, and ask students to say the answer aloud as you complete the equation.

Unit 5 Module 3 | Session 3 1 copy for display

Introducing Line 'Em Up

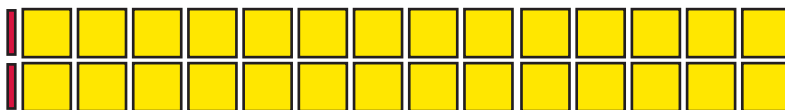
Students			Teacher		
$4 \times 7 = 28$					
$\div 2 =$		R	$\div 2 =$		R
$\div 3 =$		R	$\div 3 =$		R
$\div 4 =$		R	$\div 4 =$		R
$\div 5 =$		R	$\div 5 =$		R
$\div 6 =$		R	$\div 6 =$		R
Total Remainders			Total Remainders		

- 5 Ask each student pair to count out that many tiles and imagine that the tiles are ants.

- What will happen when they divide their ants into 2 equal lines? Will all 28 of the ants fit evenly into both of the lines, or might one of the ants be left all alone? Why or why not?

Some students will likely use their understandings of odd and even numbers to make their predictions, reasoning that if the product is even, all the tiles can be evenly divided into 2 lines, and if it is odd, there will be 1 tile left over.

- After a bit of discussion, have students divide their ants into 2 lines, using red linear pieces to mark the start of each line or row, as shown below.



- 6 Then invite a volunteer to record the results of the division with help from classmates.

If the product students rolled was an odd number, there will be one ant that can't be placed in either line. If the product rolled was even, this won't be the case, but at one point or another, there will be one or more ants that can't be placed as students divide the product into 3, 4, 5, or 6 equal lines. When this happens, introduce and explain the term *remainder*, and let students know that the letter R on the record sheet stands for remainder.

Division with remainders isn't formally introduced until Grade 4. Your third graders aren't expected to master the term or the concept of a remainder, but some early exposure to the idea won't hurt.

7 Before students do the next division in the series, ask them to make some predictions.

- Will they be able to divide their number of ants into 3 equal lines, or might there be one or more ants that can't be placed? Why or why not?
- What will happen when they divide their number of ants into 4 equal lines. Will all the ants be able to stand in one of the lines or not?
- What about when they divide their ants into 5 or 6 equal lines?

Students Since 28 is an even number, I think it's going to be easy to divide up. Like when we divided our 28 ants into 2 lines, we got 14 in each line.

I think it might be different with 3, though. I think there might be some leftover ants that don't fit into any of the lines because 3 is odd and 28 is even.

But 4 lines will work because 4×7 is 28.

I think it's not going to work out when we try to make 28 into 5 or 6 lines.

I agree with you about 5. You can't get to 28 when you count by 5s.

8 After they have made some predictions, ask students to add a third linear unit to their collection and rearrange their tiles into 3 equal rows.

- Have a volunteer record the results on the Introducing Line 'Em Up page. Does the answer make sense? Why or why not?
- If a remainder results, introduce and explain the term now.



Teacher Looks like most of you are finished dividing your 28 ants into 3 equal lines. What happened?

Students We got 9 in every line, but 1 of them wouldn't fit.

I thought maybe that would happen, because 28 is even, and 3 is odd.

You could put that last ant in one of the lines, but then it would have 10 ants, and the other 2 lines would only have 9.

Teacher When you divide a number into equal groups and wind up with some leftovers, that amount is called a remainder. In this case, you got a remainder of 1.

Andre Is a remainder a bad thing?

Teacher Well, sometimes, I guess, but not in this game. In this game, you get to record your remainders and add them up at the end. The team with the highest total wins the game.


Cara So we want to get leftovers, right?

Teacher Yep!

9 Have students complete their turn, adding linear pieces and rearranging their tiles into 4, 5, and finally 6 equal rows while the volunteer records the results of each division for the class to see.

- 10 When they're finished, ask them to share, first with a neighbor and then with the class, any observations they can make about the quotients and remainders they have recorded.

Unit 5 Module 3 | Session 3 1 copy for display

 **Introducing Line 'Em Up**

Students				Teacher			
$4 \times 7 = 28$							
28	$\div 2 =$	14	R		$\div 2 =$		R
28	$\div 3 =$	9	R 1		$\div 3 =$		R
28	$\div 4 =$	7	R		$\div 4 =$		R
28	$\div 5 =$	5	R 3		$\div 5 =$		R
28	$\div 6 =$	4	R 4		$\div 6 =$		R
Total Remainders			8	Total Remainders			

Students Our remainders add up to 8. That seems pretty good.

I didn't think we'd get so many remainders because 28 is even.

I don't really see any patterns, except the number in each line gets smaller. There's a big jump from 14 down to 9. Then after that, the jumps aren't so big.

The remainders are in a little bit of a pattern. It's 1, then 3, then 4. Only 2 is missing.

- 11 Now take your turn, working with student input to go through the same steps they did.
- Have student pairs count out the number of tiles indicated by the two numbers you rolled and multiplied, and perform each of the divisions for you, using linear pieces each time to denote the number of rows.
 - After all the divisions have been made and recorded for your tiles, ask students to add your remainders.
 - Record your sum at the bottom of the sheet and circle the winner.



Work Places

Introducing Work Place 5C Line 'Em Up

- 12 Show students the materials in the bin you've prepared for Work Place 5C.
- Let them know that when they play the game as a Work Place, they will share the same record sheet and play two rounds instead of one.
 - Emphasize the fact that each partner is responsible for helping the other, and discuss the ways in which this could happen.

Teacher When you play this game in pairs, the first player will roll, multiply, and do all the divisions before the second player takes his or her turn. What might you do if you're the second player to help your partner and keep from being bored as he or she does all that work?

Students We can make sure the other person gets the right answer for multiplying the two numbers.



Math Practices in Action 3.MP.6

Students look for and make use of regularity in repeated reasoning as they divide their number by larger and larger numbers. This repetition not only gives them practice multiplying and dividing but also helps deepen their understanding of factors, multiples, and remainders.

We could help our partner count out the number of tiles so they can go faster and be sure they get the right number to start with.

We could help our partner line up the tiles every time, and make sure the answers are right.

- 13 Have students find the Work Place Instructions 5C Line 'Em Up Student Book page in their books.
- Ask them to review the game instructions quietly.
 - Have them examine the game variations and think about whether they might want to try one of the suggestions when they play the game.
- 14 Let students know that they will go to Work Places for the remainder of the session. Encourage them to try to play Line 'Em Up today, as well as other Work Places they have not visited recently.
- Have students pick up their Work Place folders and a pencil, and remind them to fill out their Work Place Logs as they finish each activity.
- SUPPORT** Suggest specific Work Places for struggling students to work on critical skills.
- CHALLENGE** Encourage students to think about the strategies they are using and share their thinking. Encourage them to generalize what happens in certain Work Places.
- 15 At the end of class, close the session.
- Have students clean up and put away their materials.
 - Invite a few students to share something they have learned about division over the past couple of weeks.



Home Connection

- 16 Introduce and assign the More Division Practice Home Connection, which provides more practice with the following skills:
- Solve multiplication and division story problems with products and dividends to 100 involving situations of equal groups (3.OA.3)
 - Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
 - Solve two-step story problems using addition, subtraction, and multiplication (3.OA.8)
 - Fluently add with sums to 1,000 and subtract with minuends to 1,000 (3.NBT.2)



Daily Practice

The optional Multiplication Review Student Book page provides additional opportunities to apply the following skills:

- Solve for the unknown in a multiplication equation involving 3 whole numbers (3.OA.4)
- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)
- Multiply whole numbers from 1–9 by multiples of 10 from 10–90 using strategies based on place value and properties of operations (3.NBT.3)

Session 4

Division Capture

Summary

Today, the teacher plays another new game with the class, introduces it as a Work Place, and then sends students out to do Work Places. Division Capture provides practice with basic division facts in the context of an engaging game that involves strategy as well as luck.

Skills & Concepts

- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently divide with dividends to 100 using strategies (3.OA.7)
- Reason abstractly and quantitatively (3.MP.2)
- Look for and express regularity in repeated reasoning (3.MP.8)

Materials

Copies	Kit Materials	Classroom Materials
Problems & Investigations Division Capture		
TM T6 Introducing Division Capture	<ul style="list-style-type: none"> • 1 clear spinner overlay • colored tiles • red linear units (see Preparation) 	<ul style="list-style-type: none"> • students' completed Multiplication Tables Student Book page (from Unit 2, Module 3, Session 1)
Work Places Introducing Work Place 5D Division Capture		
TM T7 Work Place Guide 5D Division Capture TM T8–T12 5D Division Capture Record Sheets A–E SB 172–173* Work Place Instructions 5D Division Capture		
Work Places in Use		
4C Target One Thousand (introduced in Unit 4, Module 2, Session 3) 4D Hexagon Spin & Fill (introduced in Unit 4, Module 3, Session 3) 5A Solving Game Store Problems (introduced in Unit 5, Module 1, Session 6) 5B Scout Them Out (introduced in Unit 5, Module 2, Session 2) 5C Line 'Em Up (introduced in Unit 5, Module 3, Session 3) 5D Division Capture (introduced in this session)		
Daily Practice		
SB 174 All in the Family		

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master

Copy instructions are located at the top of each teacher master.

*Run 1 copy of these pages for use by the teacher and other adult helpers during Work Place time.

Preparation

- Organize your color tile and red linear pieces so students who need or want to use these materials for support during the first activity will be able to access them easily.
- In today's session, you'll introduce Work Place 5D Division Capture. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 5D, using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.
- Write a list of Work Places from which students can choose today. You can just write the numbers (4C–5D) or write out the full names if you prefer. (See the Work Places in Use row of the Materials Chart for the complete list of Work Places in use today.)

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

divide*
equation*
multiply*
product*
quotient*

Problems & Investigations

Division Capture

- Set the stage for the session by letting students know that you're going to play a new game with them called Division Capture.
 - Explain that the game will give them more practice with division.
 - Let them know that Division Capture will become a Work Place, available for them to use today when they go out to Work Places later in the session.
- Display the Introducing Division Capture Teacher Master, and give students a minute to examine it quietly. Then ask them to share, first in pairs and then as a whole class, any mathematical observations they can make about the sheet.

Students OK, there's a spinner that starts at 1 and goes to 10.

There are lots of division problems, like $16 \div 2$ and $30 \div 10$.

I think most of them are dividing by 2 or by 10.

Some of them are pretty easy, like $4 \div 2$, but some are harder, like $60 \div 10$.

I know that one! It's 6 because 6 times 10 is 60.

- Spend a little more time talking with students about the division facts on the master before you introduce the game.
 - Ask students to find the Multiplication Table they completed during Unit 2, Module 3 in their Student Books.
 - Have them visit in pairs, and then as a class about how the information on this page might help them solve the division facts on the teacher master.

Bridges in Mathematics Grade 3 Student Book

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Multiplication Table

Unit 2 Module 3 | Sessions 1, 3 & 4

x	0	1	2	3	4	5	6	7	8	9	10
0	0 × 0 0	0 × 1 0	0 × 2 0	0 × 3 0	0 × 4 0	0 × 5 0	0 × 6 0	0 × 7 0	0 × 8 0	0 × 9 0	0 × 10 0
1	1 × 0 0	1 × 1 1	1 × 2 2	1 × 3 3	1 × 4 4	1 × 5 5	1 × 6 6	1 × 7 7	1 × 8 8	1 × 9 9	1 × 10 10
2	2 × 0 0	2 × 1 2	2 × 2 4	2 × 3 6	2 × 4 8	2 × 5 10	2 × 6 12	2 × 7 14	2 × 8 16	2 × 9 18	2 × 10 20
3	3 × 0 0	3 × 1 3	3 × 2 6	3 × 3 9	3 × 4 12	3 × 5 15	3 × 6 18	3 × 7 21	3 × 8 24	3 × 9 27	3 × 10 30
4	4 × 0 0	4 × 1 4	4 × 2 8	4 × 3 12	4 × 4 16	4 × 5 20	4 × 6 24	4 × 7 28	4 × 8 32	4 × 9 36	4 × 10 40
5	5 × 0 0	5 × 1 5	5 × 2 10	5 × 3 15	5 × 4 20	5 × 5 25	5 × 6 30	5 × 7 35	5 × 8 40	5 × 9 45	5 × 10 50
6	6 × 0 0	6 × 1 6	6 × 2 12	6 × 3 18	6 × 4 24	6 × 5 30	6 × 6 36	6 × 7 42	6 × 8 48	6 × 9 54	6 × 10 60
7	7 × 0 0	7 × 1 7	7 × 2 14	7 × 3 21	7 × 4 28	7 × 5 35	7 × 6 42	7 × 7 49	7 × 8 56	7 × 9 63	7 × 10 70
8	8 × 0 0	8 × 1 8	8 × 2 16	8 × 3 24	8 × 4 32	8 × 5 40	8 × 6 48	8 × 7 56	8 × 8 64	8 × 9 72	8 × 10 80
9	9 × 0 0	9 × 1 9	9 × 2 18	9 × 3 27	9 × 4 36	9 × 5 45	9 × 6 54	9 × 7 63	9 × 8 72	9 × 9 81	9 × 10 90
10	10 × 0 0	10 × 1 10	10 × 2 20	10 × 3 30	10 × 4 40	10 × 5 50	10 × 6 60	10 × 7 70	10 × 8 80	10 × 9 90	10 × 10 100

- Zero facts (× 0)
- Ones facts (× 1)
- Doubles facts (× 2)
- Doubles Plus One Set facts (× 3)
- Double-Doubles facts (× 4)
- Half-Tens facts (× 5)
- Half-Tens Plus One Set facts (× 6)
- Double-Double-Doubles facts (× 8)
- Tens Minus One Set facts (× 9)
- Tens facts (× 10)

Students *I really don't know. This whole page is about multiplication, not division.*

But if you know the answer to the multiplication, it can help you with dividing. Like, if you know that 7×10 is 70, then if you divide 70 by 10, the answer has to be 7, right?

It's kind of like adding and subtracting. Like, if you know that $8 + 9$ is 17, then you can also know that $17 - 9$ must be 8. They're kind of like opposites of each other.

Teacher *A little earlier, one of you observed that most of the division facts on the sheet I have displayed up here are dividing by 2s or 10s. Thumbs up if you agree. OK... looks like most people agree with that. So, if you're working with division facts for 2s and 10s, do you need to search all over your multiplication table to find the related multiplication facts—the ones that will be most helpful to you?*

Devona *Well, we colored in all the 2s on the multiplication table yellow, so they're really easy to find. Like, if you're trying to do $16 \div 2$, you can just cut 16 in half, but you can also look on the multiplication table and find where it says 16 in the yellow boxes. Then you can tell that $16 \div 2$ is 8.*

Ellis *The 10s facts are a lot of different colors, but they're around the edges, so they're easy to find.*

4 Discuss the rules of the game with the class before you start.

Teacher *In this game we're going to take turns spinning the spinner. Each time we spin, we're going to look for a division combination we can solve with the number we spun. For example, if I spin a 2, I will look for a combination on the grid that has 2 for the answer, and write it into the box. Take a good look at our sheet and show thumbs up if you can see a combination that would be solved with an answer of 2.*

Students *I see one in the bottom row! $4 \div 2$ is 2 because if you cut 4 in half, it's 2.*


There's another one right next to it! $20 \div 10$ is 2 because it takes 2 tens to make 20.

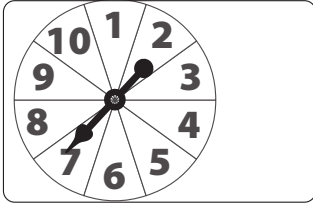
Teacher *OK, so I could choose either of those, but not both, and write the answer in the box below the combination. Here's the fun of the game, though. As you take your turns, you try to get 3 or 4 in a row, across, up and down, or diagonally. You can also try to prevent me from getting 3 or 4 in a row.*

5 Decide with the class which of you will play for red and which for blue, and enter the information on the Introducing Division Capture page. Then take the first turn.

- After you make your spin, ask students to study the 20 combinations on the grid quietly and show thumbs up when they have found one or more that will work. Encourage them to keep their Student Books open to the Multiplication Table, and use it for support through the entire game.
- Give students plenty of time so that nearly everyone has a chance to find a combination that will work, and let them know that there are exactly two combinations on the sheet that can be answered with any number spun.
- When students identify the combinations that would work with this number, ask them to explain their thinking.


Unit 5 Module 3 | Session 4 1 copy for display

 **Introducing Division Capture**



Red **The Class** Blue **Mrs. Kelly**

$16 \div 2$	$10 \div 10$	$40 \div 10$	$70 \div 10$	$6 \div 2$	Scoring 3 in a row = 1 point 4 in a row = 2 points	
$30 \div 10$	$60 \div 10$	$80 \div 10$	$12 \div 2$	$18 \div 2$		
$14 \div 2$	$100 \div 10$	$20 \div 2$	$10 \div 2$	$2 \div 2$	Red	Blue
$4 \div 2$	$20 \div 10$	$90 \div 10$	$50 \div 10$	$8 \div 2$		

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Teacher OK, I spun a 7. Talk with the person sitting next to you, and show thumbs up when you've found a combination on my sheet that would have an answer of 7.

Allyson $14 \div 2$ would work for that one.

Teacher Brendan, you were working with Allyson. How did the two of you decide on $14 \div 2$?

Brendan Because if you cut 14 in half, the answer is 7.

Chas The other one that would work is $70 \div 10$ because 7 times 10 is 70.

- 6 After students have identified the two possible combinations, select one of them and write the answer in the box, using your color—red or blue.
- 7 Choose a student to come up to the display to take a turn for the class. Once the spin has been made, repeat steps 5 and 6. When students have identified the combination(s) that would work, ask your volunteer to choose one of them and write the answer in the box, using the class's color.
- 8 Take turns spinning and recording with the class, choosing a different student to spin and record for the class each time it is their turn.
 - Give students time to think carefully about the combination they want to select if there is a choice, especially toward the middle of the game when they will need to strategize in order to capture adjacent combinations and block you from capturing adjacent combinations.
 - If you or the students spin a number that can't be used, play passes to the other team.

Toward the end of the game, you may have to take turns spinning a number of times until you or they are able to capture the last few combinations.

- 9 When all 20 combinations have been completed, circle in your color any combinations you captured that fall 3 or 4 in a row. Invite a student volunteer to do the same for the class in their color, and then have students use the scoring guide at the bottom of the sheet to calculate both scores.

Red <i>The Class</i>					Blue <i>Mrs. Kelly</i>	
$16 \div 2$ 8	$10 \div 10$ 1	$40 \div 10$ 4	$70 \div 10$ 7	$6 \div 2$ 3	Scoring 3 in a row = 1 point 4 in a row = 2 points	
$30 \div 10$ 3	$60 \div 10$ 6	$80 \div 10$ 8	$12 \div 2$ 6	$18 \div 2$ 9		
$14 \div 2$ 7	$100 \div 10$ 10	$20 \div 2$ 10	$10 \div 2$ 5	$2 \div 2$ 1	Red	Blue
$4 \div 2$ 2	$20 \div 10$ 2	$90 \div 10$ 9	$50 \div 10$ 5	$8 \div 2$ 4	4	4

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Students Hey! It turned out to be a tie game!

I thought we were going to lose when Mrs. Kelly got all those numbers in the corner.

She got a bunch of 3-in-a-rows, but we got a 4-in-a-row, and she didn't.



Work Places

Introducing Work Place 5D Division Capture

- 10 Show students the materials in the bin you've prepared for Work Place 5D.
- Let them know that when they play the game as a Work Place, they will share the same record sheet, just as they did with you today.
 - Explain that there are 5 different record sheets. The first features 2s and 10s, the second features 3s and 2s, and so on.
- Depending on the needs of your students, ask them to complete the sheets in order, with the goal of completing all 5 within the next couple of weeks, or give them the option of completing them in any order they choose. You might also let them know that it's OK to play the game more than once using another copy of the same sheet, especially if that sheet has facts they need to practice.*
- 11 Have students find the Work Place Instructions 5D Division Capture Student Book page in their books.
- Ask them to review the game instructions quietly.
 - Have them examine the game variations and think about whether they might want to try one of the suggestions when they play the game.

- 12 Let students know that they will go to Work Places for the remainder of the session. Encourage them to try to play Division Capture today, as well as other Work Places they have not visited recently.

Have students pick up their Work Place folders and a pencil, and remind them to fill out their Work Place Logs as they finish each activity.

- 13 At the end of class, close the session.
- Have students clean up and put away their materials.
 - Invite a few students to share something they have learned about division over the past couple of weeks.

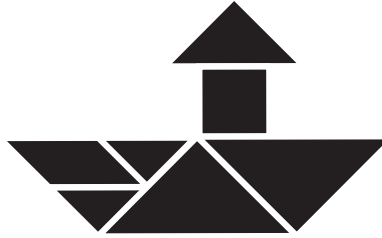


Daily Practice

The optional All in the Family Student Book page provides additional opportunities to apply the following skills:

- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)
- Make sense of problems and persevere in solving them (3.MP.1)

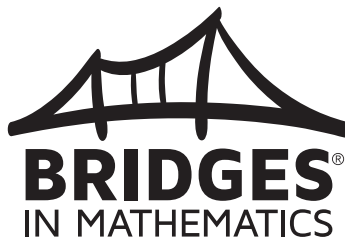
Preview



Teacher Masters

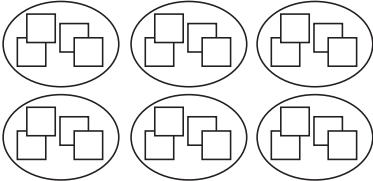
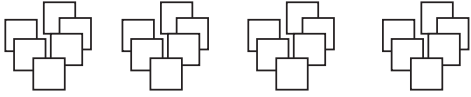
GRADE 3 – UNIT 5 – MODULE 3

Preview



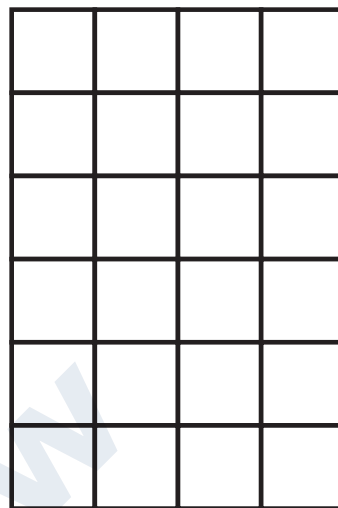
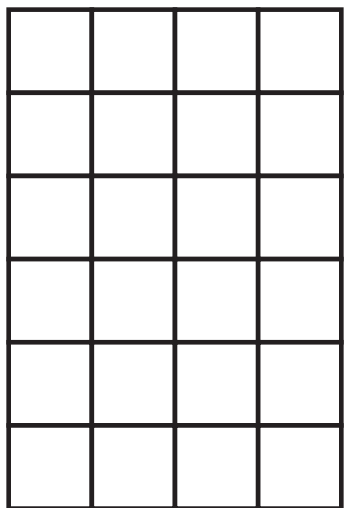
Sharing & Grouping Forum Planner

Use this planner to make a record of the strategies you see students using to solve problems during Session 1. Prior to Session 2, use the third column to indicate the order in which you plan to have students share during the forum.

Strategy	Student Names & Notes	Order of Sharing in Forum										
<p>Problems 3, 6, 8: Sharing One by One Look for student pairs who count out the number of tiles defined by the dividend, and then share out those tiles 1 by 1 (as one might do in dealing out cards) into the number of groups defined by the divisor.</p>  <p>We took 24 tiles and divided them into 6 groups We got 4 in each group.</p>												
<p>Problems 3, 6, 8: Sharing in Groups Larger Than One Look for students who use a sharing strategy as above but deal out the tiles in sets larger than 1 (e.g., placing 2 or more tiles in each of the groups they're making, rather than dealing them out one by one).</p>												
<p>Problem 4, 5, 7: Grouping Look for pairs who count out the number of tiles defined by the dividend and then pull off groups of the divisor until all the tiles have been used.</p>  <p>We took 24 tiles and took out a group of 6, and then another, and then another until we used up all the tiles. We got 4 groups.</p>												
<p>Problems 3-8: Using Known Facts Look for students who use their knowledge of multiplication facts to solve or confirm their answers to story problems that involve the related division facts.</p> <p>I know I got the right answer for problem 5 because he had 36 cookies and put 4 in each bag. I got 9 bags, and 4×9 is 36.</p>												
<p>Problems 4, 5, 7: Ratio Table You might find a few students who use a ratio table to model and solve grouping problems. For example, problem 4 can be solved by tracking the number of stickers per page until one determines the total number of pages needed to accommodate 24 stickers if each page holds 6.</p> <table border="1" data-bbox="354 1440 594 1629"> <thead> <tr> <th>Pages</th> <th>Stickers</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6</td> </tr> <tr> <td>2</td> <td>12</td> </tr> <tr> <td>3</td> <td>18</td> </tr> <tr> <td>4</td> <td>24</td> </tr> </tbody> </table>	Pages	Stickers	1	6	2	12	3	18	4	24		
Pages	Stickers											
1	6											
2	12											
3	18											
4	24											



Two Different Ways to Look at an Array



- 1** Ms. Rowan has 6 tables in her classroom, and 24 students. If she divides the students evenly among the tables, how many students will sit at each table?
- a** Equation:
- b** The answer to this problem tells
- How many in each group
- How many groups
- 2** Teresa has 24 stickers in her sticker book. Each page holds 6 stickers. How many pages does her sticker book have?
- a** Equation:
- b** The answer to this problem tells
- How many in each group
- How many groups



Introducing Line 'Em Up

Students			
	$\div 2 =$		R
	$\div 3 =$		R
	$\div 4 =$		R
	$\div 5 =$		R
	$\div 6 =$		R
Total Remainders			

Teacher			
	$\div 2 =$		R
	$\div 3 =$		R
	$\div 4 =$		R
	$\div 5 =$		R
	$\div 6 =$		R
Total Remainders			

Preview



Work Place Guide 5C Line 'Em Up

Summary

The game Line 'Em Up is based on the story *One Hundred Hungry Ants* (which some students may remember from Grade 2 Bridges). Each player rolls two dice, multiplies the two numbers, and then divides that number of bugs (modeled with tiles) into 2, 3, 4, 5, and finally 6 rows. Players record the results of each division, including any remainders. At the end of the game, both players add up their remainders and the player with the greater sum wins.


Skills & Concepts

- Interpret quotients of whole numbers (3.OA.2)
- Write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)

Materials

Copies	Kit Materials	Classroom Materials
TM T4 Work Place Guide 5C Line 'Em Up TM T5 5C Line 'Em Up Record Sheet SB 169–170 Work Place Instructions 5C Line 'Em Up	<ul style="list-style-type: none"> • 300 colored tiles • 36 red linear units • three 1–6 dice • three 4–9 dice • base 10 area and linear pieces for Game Variation B 	

Assessment & Differentiation

If you see that...	Differentiate	Example
Students are struggling to accurately multiply the two numbers they roll, or struggling to carry out the division.	<p>SUPPORT Have two students who are working at about the same level use two dice numbered 1–6 instead of one numbered 1–6 and one numbered 4–9. Have them build an array to model and solve the multiplication combination rolled, and then divide the resulting collection of tiles into 2, 3, 4, 5, and 6 lines.</p> <p>SUPPORT Insist that students support each other in taking their turns, rather than working separately (see note below).</p>	<p>Teacher I see you rolled a 4 and a 5. Can you build a tile array to model and solve 4×5?</p> <p>Student I don't really know what that means.</p> <p>Teacher Let's frame it with the red linear pieces, 4 going up the side, and 5 across the top. When you fill that in, how many tiles do you think you'll have in all?</p> <p>Student I don't know, but it's going to have 4 rows, and 5 in every row.</p> <p>Teacher Why don't you build that and call me back to see your work when you're done?</p> 
Students are quite proficient with multiplication facts, and understand the operation of division well.	<p>CHALLENGE Invite these students to try Game Variation B, in which they'll use 2 dice numbered 4–9. At this level, they'll be working with division facts as high as $81 \div 2$ and should have access to base 10 area and linear pieces to model and solve the larger combinations.</p>	
<p>English-Language Learners Use the following adaptations to support the ELL students in your classroom.</p> <ul style="list-style-type: none"> • Play this game with small groups of ELL students, modeling how to play and what to do. Take the opportunity to reinforce the terms <i>multiply</i>, <i>divide</i>, <i>division</i>, <i>dividend</i>, <i>divisor</i>, and <i>quotient</i> as you play. • Encourage ELL students to play with same-language peers in their own language. 		

Note One of the most important features of this game is the cooperation required between partners, no matter what their skill level. While it might seem more efficient to have both students make their rolls and do their divisions at the same time, it is very valuable, both in terms of insuring accuracy and promoting dialog, to have pairs work together to make sure the tiles are counted out and divided correctly.

NAME _____

DATE _____



Line 'Em Up Record Sheet

Player 1 _____

Player 2 _____

Round 1							
	$\div 2 =$		R		$\div 2 =$		R
	$\div 3 =$		R		$\div 3 =$		R
	$\div 4 =$		R		$\div 4 =$		R
	$\div 5 =$		R		$\div 5 =$		R
	$\div 6 =$		R		$\div 6 =$		R

Round 2							
	$\div 2 =$		R		$\div 2 =$		R
	$\div 3 =$		R		$\div 3 =$		R
	$\div 4 =$		R		$\div 4 =$		R
	$\div 5 =$		R		$\div 5 =$		R
	$\div 6 =$		R		$\div 6 =$		R

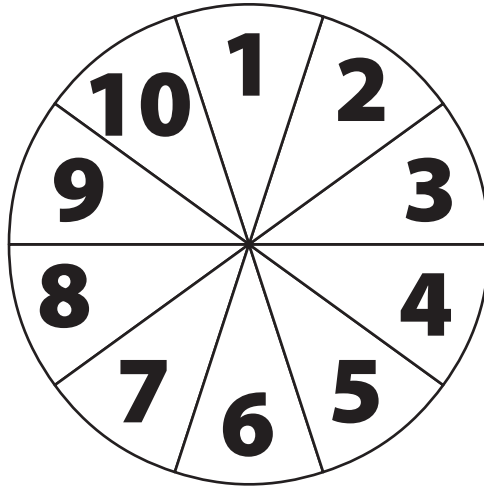
After you have played both rounds, add all of your remainders. The player with the higher total wins.

Total remainders for player 1

Total remainders for player 2



Introducing Division Capture



Red _____ Blue _____

$16 \div 2$	$10 \div 10$	$40 \div 10$	$70 \div 10$	$6 \div 2$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$30 \div 10$	$60 \div 10$	$80 \div 10$	$12 \div 2$	$18 \div 2$		
$14 \div 2$	$100 \div 10$	$20 \div 2$	$10 \div 2$	$2 \div 2$	Red	Blue
$4 \div 2$	$20 \div 10$	$90 \div 10$	$50 \div 10$	$8 \div 2$		



Work Place Guide 5D Division Capture

Summary

Players spin to determine who goes first as well as whether to play for red or blue. Then players take turns spinning for a number they can use to complete one of 20 division combinations on a grid. Each partner uses a different color to write their numbers on the grid. Once all the equations are completed, players look for and circle in their own color any equations they completed that fall in a row, either vertically, horizontally, or diagonally. Each player earns a point for any three equations in a row they completed and 2 points for any four equations in a row they completed. The player with the higher score wins the game.

Skills & Concepts

- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently divide with dividends to 100 using strategies (3.OA.7)

Materials

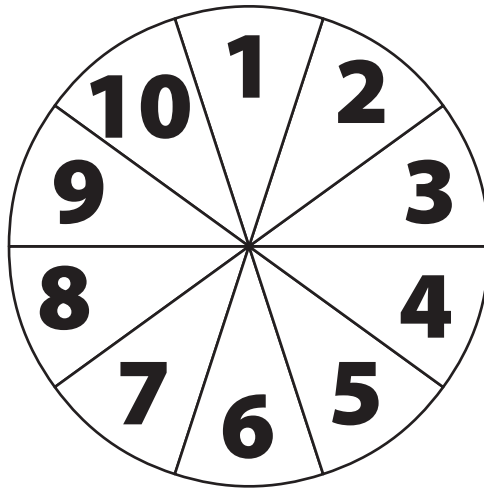
Copies	Kit Materials	Classroom Materials
TM T7 Work Place Guide 5D Division Capture TM T8–12 5D Division Capture Record Sheets A–5 SB 172–173 Work Place Instructions 5D Division Capture	<ul style="list-style-type: none"> • 3 clear spinner overlays • 6 colored pencils, 3 in red and 3 in blue • colored tiles • red linear units 	<ul style="list-style-type: none"> • students' completed Multiplication Tables Student Book pages (from Unit 2, Module 3, Session 1)

Assessment & Differentiation

If you see that...	Differentiate	Example
Students are struggling with basic division facts, either because they don't understand the operation or because they haven't developed enough fluency with multiplication to be able to deal with the related division facts.	<p>SUPPORT Encourage students to use colored tiles and red linear pieces to model and solve the combinations. This may be quite tedious, and you might consider having these students spend more time with Work Places 5B Scout Them Out, or 5C Line 'Em Up before they do too much with this Work Place.</p> <p>SUPPORT Allow students working at roughly the same level to use the same record sheet for several times running before they move on to the next. The 5 record sheets go in order from easiest to most challenging, so encourage these students to work them in order rather than skipping around.</p> <p>SUPPORT Invite all your students, not just those who are struggling, to use the Multiplication Table Student Book page they completed during Unit 2, Module 3, for help in solving division combinations.</p>	<p>Some pairs of students may benefit from playing the game several times with Record Sheet 1, which features division facts for 2s and 10s, before moving on to Record Sheet 2.</p> <p>Teacher Looks like you're stuck on $48 \div 6$. Can you find a fact on your Multiplication Table that would help you solve that problem?</p> <p>Student Umm ...well, I see the answer 48 right here, and it says 6×8 is 48.</p> <p>Teacher How can you use that information to help with your division problem?</p> <p>Student If 6×8 is 48, then if I divide 48 by 6, the answer must be 8.</p>
Students are struggling to find the division combinations they need on the grid.	<p>SUPPORT Pair students who are working at roughly the same level, and invite them to use Game Variation B. Players fill in the answers to all of the division combinations on the grid before they start playing the game. This simplifies the game because they don't have to search for the two combinations on the sheet that can be solved with any number they spin; they have only to find and circle the numbers they've already entered on the grid.</p>	<p>Encourage these students to use the Multiplication Table Student Book page they completed during Unit 2, Module 3, for help in finding the answers to the division combinations as they work together to fill in the grid. This will help reinforce the connection between multiplication and division facts.</p>
Students are working easily with division facts.	<p>CHALLENGE Pair students who are working at roughly the same level. Invite them to choose the order in which they use the sheets and possibly skip those sheets that feature facts with which they're already fluent.</p>	
<p>English-Language Learners Use the following adaptations to support the ELL students in your classroom.</p> <ul style="list-style-type: none"> • Play this game with small groups of ELL students, modeling how to play and what to do. Take the opportunity to reinforce the terms <i>divide</i>, <i>division</i>, and <i>quotient</i> as you work with the students. • Encourage ELL students to play with same-language peers in their own language. 		



5D Division Capture Record Sheet A, Twos & Tens

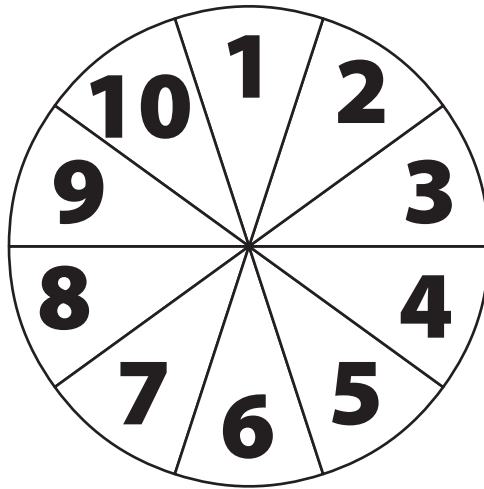


Red _____ Blue _____

$100 \div 10$	$60 \div 10$	$80 \div 10$	$12 \div 2$	$50 \div 10$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$16 \div 2$	$10 \div 10$	$6 \div 2$	$70 \div 10$	$18 \div 2$		
$4 \div 2$	$20 \div 10$	$90 \div 10$	$40 \div 10$	$8 \div 2$	Red	Blue
$14 \div 2$	$30 \div 10$	$20 \div 2$	$10 \div 2$	$2 \div 2$		



5D Division Capture Record Sheet B, Threes & Twos

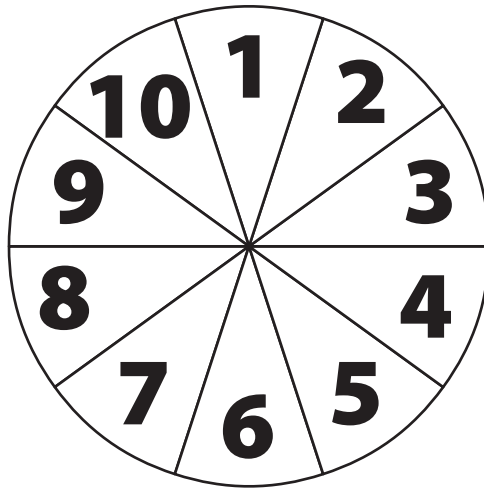


Red _____ Blue _____

$21 \div 3$	$8 \div 2$	$3 \div 3$	$18 \div 2$	$12 \div 3$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$16 \div 2$	$24 \div 3$	$6 \div 2$	$9 \div 3$	$20 \div 2$		
$18 \div 3$	$4 \div 2$	$6 \div 3$	$10 \div 2$	$30 \div 3$	Red	Blue
$14 \div 2$	$15 \div 3$	$2 \div 2$	$27 \div 3$	$12 \div 2$		



5D Division Capture Record Sheet C, Fours & Twos

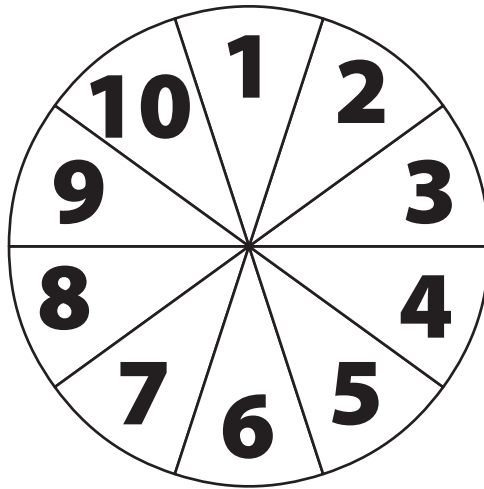


Red _____ Blue _____

$12 \div 4$	$36 \div 4$	$8 \div 4$	$12 \div 2$	$28 \div 4$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$16 \div 2$	$16 \div 4$	$6 \div 2$	$32 \div 4$	$18 \div 2$		
$4 \div 2$	$40 \div 4$	$20 \div 2$	$20 \div 4$	$8 \div 2$	Red	Blue
$14 \div 2$	$24 \div 4$	$4 \div 4$	$10 \div 2$	$2 \div 2$		



5D Division Capture Record Sheet D, Fives & Tens

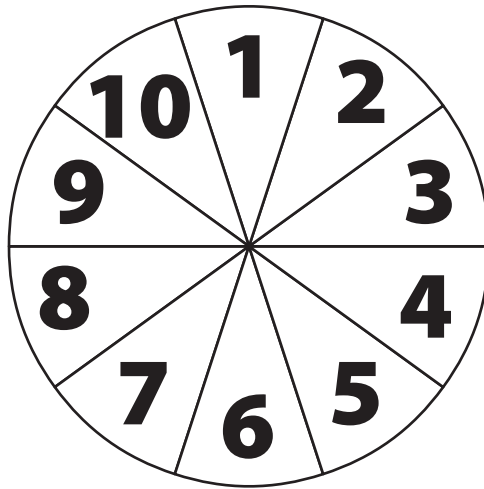


Red _____ Blue _____

$15 \div 5$	$50 \div 10$	$10 \div 5$	$60 \div 10$	$35 \div 5$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$80 \div 10$	$20 \div 5$	$30 \div 10$	$5 \div 5$	$90 \div 10$		
$20 \div 10$	$40 \div 5$	$100 \div 10$	$30 \div 5$	$40 \div 10$	Red	Blue
$70 \div 10$	$25 \div 5$	$45 \div 5$	$50 \div 5$	$10 \div 10$		



5D Division Capture Record Sheet E, Sixes & Fives



Red _____ Blue _____

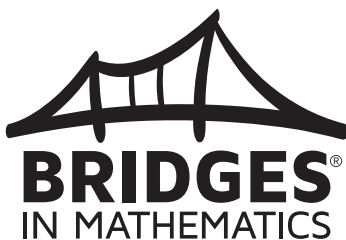
$15 \div 5$	$50 \div 5$	$10 \div 5$	$36 \div 6$	$35 \div 5$	<p>Scoring</p> <p>3 in a row = 1 point</p> <p>4 in a row = 2 points</p>	
$48 \div 6$	$20 \div 5$	$18 \div 6$	$5 \div 5$	$54 \div 6$		
$12 \div 6$	$40 \div 5$	$60 \div 6$	$30 \div 5$	$24 \div 6$	Red	Blue
$42 \div 6$	$25 \div 5$	$45 \div 5$	$30 \div 6$	$6 \div 6$		



Student Book

GRADE 3 – UNIT 5 – MODULE 3

Preview





More Story Problems page 1 of 2

1 Write your own story problem to fit this equation: $7 \times 5 = m$

2 Write your own story problem to fit this equation: $35 \div 5 = n$

Solve each problem in your math journal. Show your thinking using numbers, labeled sketches, or words. Then write an equation that represents the problem and the solution on this page.

3 Ms. Rowan has 6 tables in her classroom, and 24 students. If she divides the students evenly among the tables, how many students will sit at each table?

4 Teresa has 24 stickers in her sticker book. Each page holds 6 stickers. How many pages does her sticker book have?

5 Steve baked 36 cookies. He put 4 cookies in each bag. How many bags of cookies did he have?

6 Craig gave his sister 4 boxes of new markers. She was happy to get 36 new markers. How many markers were in each box, if each box held exactly the same number of markers?

7 Ms. Allyn was getting ready for a math investigation. Each student needed 8 paperclips. She had 32 paperclips. How many students were able to do the investigation?

(continued on next page)

More Story Problems page 2 of 2

8 The math club was going on a field trip. They were driving 8 school vans. If there were 32 students in the math club, and each van took the same number of students, how many students went in each van?

9 Each student in the gym class gathered 4 tennis balls. There were 25 students in the class. Then, the gym teacher divided the balls evenly into 20 different buckets. How many balls are in each bucket?

Which equation would help you solve this problem?

$(4 + 25) \times 20 = b$

$(4 \times 25) + 20 = b$

$(20 \div 4) - 24 = b$

$(4 \times 25) \div 20 = b$

10 CHALLENGE Mr. Garner gathered \$6.50 from each student going to a music festival. He needed to divide the money evenly to pay the field trip helpers: the bus driver, the lunchroom lady, the person running the festival, and the photographer. He has 26 students going to the festival. How much money did he pay each field trip helper?



Division Practice

1 Fill in the blanks.

$3 \times \underline{\quad} = 15$

$15 \div 3 = \underline{\quad}$

$28 \div 7 = \underline{\quad}$

$7 \times \underline{\quad} = 28$

$\underline{\quad} \times 4 = 24$

$24 \div \underline{\quad} = 4$

$30 \div \underline{\quad} = 5$

$\underline{\quad} \times 5 = 30$

$3 \times 2 = \underline{\quad}$

$\underline{\quad} \div 2 = 3$

$\underline{\quad} = 8 \times 7$

$\underline{\quad} \div 8 = 7$

$399 + 203 = \underline{\quad}$

$302 - 198 = \underline{\quad}$

2 Solve the problems below. Show your thinking in words, numbers, or sketches.

a Mr. See has a collection of stamps. He has 45 total stamps, with 9 stamps on each page. How many pages of stamps does he have?

b Mrs. Kay has a photo album with 9 pages in it, and 45 photos. How many photos can she put on each page if she wants to put exactly the same number on every page in the album?

NAME _____

DATE _____

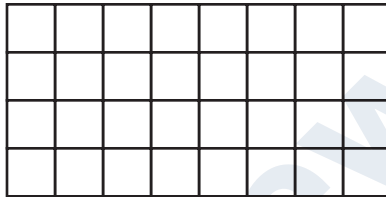


More Arrays page 1 of 2

For the arrays in each pair below:

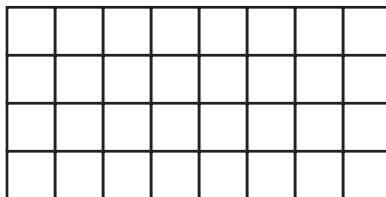
- Mark the array to show the number you started with (the dividend), the number you divided by (the divisor), and the answer (the quotient).
- Write an equation to represent the problem.
- Fill in the bubble to show whether you were trying to find the number in each group or the number of groups.

- 1** Steve baked 36 cookies. He put 4 cookies in each bag. How many bags of cookies did he have?



<p>a Equation</p>	<p>b The answer to this problem tells</p> <p><input type="radio"/> How many in each group</p> <p><input type="radio"/> How many groups</p>
--------------------------	---

- 2** Craig gave his sister 4 boxes of new markers. She was happy to get 36 new markers. How many markers were in each box, if each box held exactly the same number of markers?



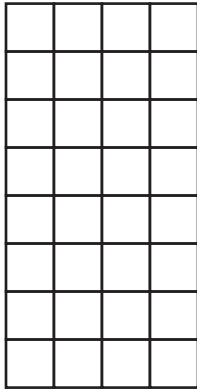
<p>a Equation</p>	<p>b The answer to this problem tells</p> <p><input type="radio"/> How many in each group</p> <p><input type="radio"/> How many groups</p>
--------------------------	---

NAME _____

DATE _____

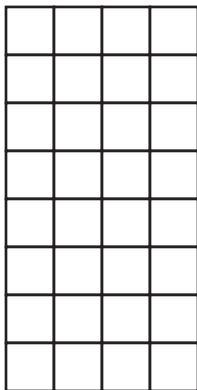
More Arrays page 2 of 2

- 3** Ms. Allyn was getting ready for a math investigation. Each student needed 8 paperclips. She had 32 paperclips. How many students were able to do the investigation?



<p>a Equation</p>	<p>b The answer to this problem tells</p> <p><input type="radio"/> How many in each group</p> <p><input type="radio"/> How many groups</p>
--------------------------	---

- 4** The math club was going on a field trip. They were driving 8 school vans. If there were 32 students in the math club, and each van took the same number of students, how many students went in each van?



<p>a Equation</p>	<p>b The answer to this problem tells</p> <p><input type="radio"/> How many in each group</p> <p><input type="radio"/> How many groups</p>
--------------------------	---

NAME _____

DATE _____



Mixed Operations & Story Problems

1 Fill in the blanks.

$6 \times \underline{\quad} = 42$

$42 \div 6 = \underline{\quad}$

$97 - \underline{\quad} = 55$

$54 \div 6 = \underline{\quad}$

$6 \times \underline{\quad} = 54$

$\underline{\quad} \div 8 = 3$

$\underline{\quad} + 87 = 101$

$101 - 87 = \underline{\quad}$

$3 \times 8 = \underline{\quad}$

2 Write an equation for each problem. Be sure to include the unit in your final answer. Show your thinking in words, numbers, or sketches. Use your math journal if you need more room.

- a** Jeremy is setting up for a party. He has 63 cookies. He puts 7 cookies on each plate. How many plates does he use?

Equation: _____ Final Answer: _____

- b** Katina is helping to set up for the party. She puts 63 brownies on 7 different plates. How many brownies are on each plate?

Equation: _____ Final Answer: _____

3 Write a story problem for each of these equations.

$12 \times 4 = 48$

$48 \div 4 = 12$



Work Place Instructions 5C Line 'Em Up page 1 of 2

Each pair of players needs:

- one 5C Line 'Em Up Record Sheet
- one 1–6 die and one 4–9 die
- about 100 colored tiles
- 12 red linear pieces
- base ten area and linear pieces (for Game Variation B)

- 1 Players take turns rolling one die to see who goes first, and then write their names on the record sheet they're sharing.
- 2 Player 1 rolls both dice, multiplies the two numbers, and writes an equation on his side of the record sheet to show the product.
- 3 Player 1 counts out that many tiles and imagines they are bugs or anything else that might be divided into different numbers of lines.
- 4 Player 1 divides his tiles into 2 lines first. Then he divides them into 3, 4, 5, and 6 lines.
 - The player uses red linear pieces each time to show the number of lines he's making.
 - Each time, he records an equation showing the division, making sure his partner is helping and agrees with his equations.

Unit 5 Module 3 | Session 3 *half-class set, plus more as needed, stored in the Work Place bin*

NAME Jorge | DATE _____

Line 'Em Up Record Sheet

Player 1 Jorge | Player 2 _____

Round 1									
$5 \times 7 = 35$									
35	$\div 2 =$	17	R	1		$\div 2 =$		R	
35	$\div 3 =$	11	R	2		$\div 3 =$		R	
35	$\div 4 =$	8	R	3		$\div 4 =$		R	
35	$\div 5 =$	7	R			$\div 5 =$		R	
35	$\div 6 =$	5	R	5		$\div 6 =$		R	

- 5 Player 2 repeats steps 2–5.
- 6 After both players have completed two rounds they each add up all their remainders. The player with the higher total wins.

Work Place Instructions 5C Line 'Em Up page 2 of 2

Game Variations

A Use 2 dice numbered 1–6 instead of 1 die numbered 1–6 and 1 numbered 4–9.

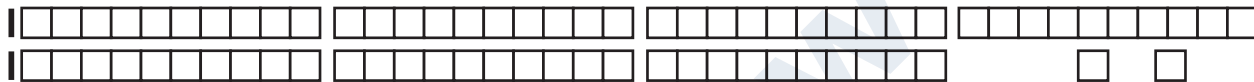
If the product of the roll is 5 or less, players won't be able to divide it into 6 equal lines, and the amount will be a remainder. For example, if a player rolls 2×2 for a product of 4, she won't be able to divide that amount into 5 or 6 equal lines, and will wind up with the following results:

- $4 \div 2 = 2$
- $4 \div 3 = 1 \text{ R}1$
- $4 \div 4 = 1$
- $4 \div 5 = 0 \text{ R}4$
- $4 \div 6 = 0 \text{ R}4$

B Use 2 dice numbered 4–9 instead of 1 die numbered 1–6 and 1 numbered 4–9.

If players use this game variation, they will need to use base 10 strips and linear pieces instead of the colored tiles and red linear pieces to model and solve at least some of the division combinations.

Connor OK, I rolled an 8 and a 9, and 9×8 is 72. Wow—that's a big number. Maybe I'll get some big remainders! I'm going to use the base ten pieces for this one—the tiles will take way too long.



Connor 72 divided by 2. It's 3 strips in each row, and we've got 12 left over. That's going to split into 6 and 6, see?

Rafael Yup, so $72 \div 2$ is, let's see, 30 and 6 more for each. It's 36 with no remainder.

Connor You're right!



NAME _____

DATE _____



Multiplication Review

1 Complete the multiplication facts.

$$\begin{array}{r} 10 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$$

2 Fill in the missing number in each fact. Then write a related division equation.

<p>ex</p> $\begin{array}{r} \square \\ \times 5 \\ \hline 20 \end{array}$ <p>$20 \div 5 = \square$</p>	<p>a</p> $\begin{array}{r} \square \\ \times 2 \\ \hline 16 \end{array}$ <p>$\square \div \square = \square$</p>	<p>b</p> $\begin{array}{r} 5 \\ \times \square \\ \hline 35 \end{array}$ <p>$\square \div \square = \square$</p>	<p>c</p> $\begin{array}{r} \square \\ \times 9 \\ \hline 18 \end{array}$ <p>$\square \div \square = \square$</p>
--	--	--	--

3 **CHALLENGE** Use what you know about basic facts to complete these problems.

$$\begin{array}{r} 20 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 62 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 62 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 87 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 382 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 63 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 52 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ \times 69 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 4 \\ \hline \end{array}$$



Work Place Instructions 5D Division Capture page 1 of 2

Each pair of players needs:

- 1 5D Division Record Sheet
- 1 clear spinner overlay
- 1 red and 1 blue colored pencil
- the completed Multiplication Table page from their Student Books (optional)
- colored tiles and red linear pieces (optional)

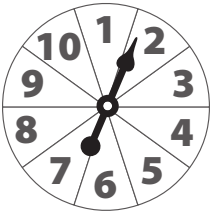
- 1** Players take turns spinning the spinner. The player who gets the higher number goes first and decides whether he wants to play for red or blue.
- 2** Player 1 spins the spinner, and uses the number he spins to fill in the answer to one of the division problems on the record sheet, using a pencil in the color he chose.
- 3** Player 2 takes her turn, and then the players take turns back and forth.
 - Each player tries to capture 3 or 4 boxes in a row—across, up and down, or diagonally.
 - If the box a player needs is already filled, the player loses that turn and must wait until her next turn to try again.

Note Each number on the spinner has exactly 2 combinations on the grid that match. If a player spins a 3 and there are already two 3s written on the grid, she will not be able to find another and will lose that turn.
- 4** Players continue to take turns until the record sheet is filled or neither player can use the number he or she spins 3 times in a row.
- 5** Players each circle the places on the grid where they got 3 or 4 in a row, add up their points, and record their scores on the record sheet.
 - Players get 1 point for each row of 3 they capture, and 2 points for each row of 4 they capture.
- 6** The player with the higher total wins.

Work Place Instructions 5D Division Capture page 2 of 2

Unit 5 Module 3 | Session 4 1 copy for display

5D Division Capture Record Sheet A, Twos & Tens



Red James Blue Sally

$100 \div 10$ 10	$60 \div 10$ 6	$80 \div 10$ 8	$12 \div 2$ 6	$50 \div 10$ 5	Scoring 3 in a row = 1 point 4 in a row = 2 points
$16 \div 2$ 8	$10 \div 10$ 1	$6 \div 2$ 3	$70 \div 10$ 7	$18 \div 2$ 9	
$4 \div 2$ 2	$20 \div 10$ 2	$90 \div 10$ 9	$40 \div 10$ 4	$8 \div 2$ 4	Red 4
$14 \div 2$ 7	$30 \div 10$ 3	$20 \div 2$ 10	$10 \div 2$ 5	$2 \div 2$ 1	Blue 3

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Game Variations

- A** Players can use the Multiplication Tables in their Student Books they completed during Unit 2 to help solve the division problems. They can also use the colored tiles and red linear units to help if they want.
- B** Players take turns using a regular pencil to fill in the answers to the division problems until the grid is complete. Then they play the game as usual, but they find and circle the answers in their own color pencil instead of writing in the answers as they go.
- This makes the game a little easier, because the players just have to search for the numbers they spin, instead of searching for the combinations that will give them those numbers.
- C** There are five different Division Capture record sheets, each one a little more challenging than the one before it. Depending on players' needs, they can:
- Use the same record sheet more than once if they need practice with the facts on that sheet.
 - Start with the first record sheet, and use the rest in order over several different Work Place times.
 - Start with the record sheet that provides practice with the facts they most need to work on. For example, if both players know their division facts for 2, 3, and 10 pretty well already, they might choose to start with Record Sheet 4 or 5, instead of working through the sheets one by one, starting from 1.



All in the Family

1 Fill in the missing number in each triangle. Then write the facts in the fact family.

<p>ex</p> <div style="text-align: center;"> </div> $\begin{aligned} 2 \times 8 &= 16 \\ 8 \times 2 &= 16 \\ 16 \div 2 &= 8 \\ 16 \div 8 &= 2 \end{aligned}$	<p>a</p> <div style="text-align: center;"> </div> $\begin{aligned} ___ \times ___ &= ___ \\ ___ \times ___ &= ___ \\ ___ \div ___ &= ___ \\ ___ \div ___ &= ___ \end{aligned}$	<p>b</p> <div style="text-align: center;"> </div> $\begin{aligned} ___ \times ___ &= ___ \\ ___ \times ___ &= ___ \\ ___ \div ___ &= ___ \\ ___ \div ___ &= ___ \end{aligned}$
<p>c</p> <div style="text-align: center;"> </div> $\begin{aligned} ___ \times ___ &= ___ \\ ___ \times ___ &= ___ \\ ___ \div ___ &= ___ \\ ___ \div ___ &= ___ \end{aligned}$	<p>d</p> <div style="text-align: center;"> </div> $\begin{aligned} ___ \times ___ &= ___ \\ ___ \times ___ &= ___ \\ ___ \div ___ &= ___ \\ ___ \div ___ &= ___ \end{aligned}$	<p>e</p> <div style="text-align: center;"> </div> $\begin{aligned} ___ \times ___ &= ___ \\ ___ \times ___ &= ___ \\ ___ \div ___ &= ___ \\ ___ \div ___ &= ___ \end{aligned}$

2 CHALLENGE Use multiplication and division to find the secret path through each maze. You can only move one space up, down, over, or diagonally each time. Write two equations to explain the path through the maze.

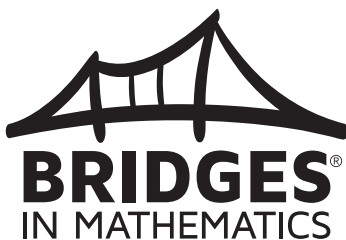
<p>ex</p> <div style="text-align: center;"> </div> $\begin{aligned} 3 \times 8 &= 24 \\ 24 \div 6 &= 4 \end{aligned}$	<p>a</p> <div style="text-align: center;"> </div>	<p>b</p> <div style="text-align: center;"> </div>
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Home Connections

GRADE 3 – UNIT 5 – MODULE 3

Preview



NAME _____

DATE _____

**More Number Puzzles** page 1 of 2**1** Draw a line from each expression on the left to the equivalent expression on the right.

ex 3×5	5×1
a 6×10	2×8
b $20 \div 4$	$30 \div 2$
c 16×1	2×4
d $24 \div 3$	15×2
e 6×4	8×3
f 6×5	2×30

2 Write an equal (=), greater than (>), or less than (<) sign in the boxes to make each equation true.

ex 2×5 3×4

a $12 \div 4$ 3×1

b 5×1 $12 \div 3$

c 8×2 4×4

d $25 \div 5$ 4×2

e 8×4 12×2

f $20 \div 2$ 3×5

3 Dani says you can show the solution to $2 \times 5 \times 3$ with one equation:

$2 \times 5 = 10 \times 3 = 30$

Maya says you have to use two equations:

$2 \times 5 = 10$ and $10 \times 3 = 30$

a Which student is correct? _____**b** Explain your answer.*(continued on next page)*

More Number Puzzles page 2 of 2

- 4** Andy had 30 marbles. He gave half of his marbles to his 3 cousins. His 3 cousins divided the marbles equally.

Jan had 48 marbles. She gave half of her marbles to her 4 cousins. Her 4 cousins divided the marbles equally.

- a** Whose cousins got more marbles, Andy's cousins or Jan's cousins? _____
- b** Use labeled sketches, numbers, or words to prove your answer.

- 5** Tim went to the pet store. He saw 3 cages of mice. There were 4 mice in each cage. He also saw 2 cages of hamsters. There were 6 hamsters in each cage. How many animals did Tim see in all?

- a** Circle the expression that best represents this problem.

$$(3 \times 2) + (6 \times 4) = a \qquad (3 \times 4) + (2 \times 6) = a \qquad (4 \times 1) + (2 \times 3) = a$$

- b** Then find the answer. Show your work.

- 6** **CHALLENGE** Use the digits 0–9 each just one time. Write them in the boxes below. Make each multiplication problem correct.

0	1	2	3	4	5	6	7	8	9
$\begin{array}{r} \square \\ \times 6 \\ \hline 36 \end{array}$		$\begin{array}{r} \square \\ \times \square \\ \hline \square 8 \end{array}$		$\begin{array}{r} \square \\ \times 4 \\ \hline 2\square \end{array}$		$\begin{array}{r} \square \\ \times \square \\ \hline 12 \end{array}$		$\begin{array}{r} \square \\ \times \square \\ \hline \square \square \end{array}$	



More Division Practice page 1 of 2

1 Fill in the blanks.

a $4 \times \underline{\hspace{2cm}} = 24$

$24 \div 4 = \underline{\hspace{2cm}}$

b $36 \div 9 = \underline{\hspace{2cm}}$

$9 \times \underline{\hspace{2cm}} = 36$

c $\underline{\hspace{2cm}} \times 5 = 35$

$35 \div \underline{\hspace{2cm}} = 5$

d $21 \div \underline{\hspace{2cm}} = 7$

$\underline{\hspace{2cm}} \times 7 = 21$

e $4 \times 3 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} \div 4 = 3$

f $\underline{\hspace{2cm}} = 9 \times 6$

$\underline{\hspace{2cm}} \div 9 = 6$

g $403 + 296 = \underline{\hspace{2cm}}$

h $403 - 296 = \underline{\hspace{2cm}}$

2 Solve the story problems below. Show your thinking in words, numbers, or sketches for each one. Be sure to label your answers with the correct units.

a Mr. Bee bought 3 jars of honey, which weighed a total of 24 ounces. If all the jars weighed the same amount, how much did each jar weigh?

Each jar weighed _____.

b Mrs. Bee also bought 24 ounces of honey. She put 3 ounces of honey into several small jars. How many jars did she use?

Mrs. Bee used _____.

3 Compare problems 2a and 2b. How are they alike? How are they different?

(continued on next page)

More Division Practice page 2 of 2

4 Mrs. Moth picked 8 flowers. Each flower had 6 petals.

a How many petals are on the flowers that Mrs. Moth picked? Show your work.

b Write an equation that describes problem 4a. _____

5 **CHALLENGE** Later, Mrs. Moth picked 24 more flowers. Six of them each had 9 petals, 7 of them each had 8 petals, 5 of them each had 3 petals, and the rest each had 10 petals.

a How many flowers had 10 petals? Show your work.

b How many petals were on all 24 of the flowers that Mrs. Moth picked? Show your work.