

UNIT

11

Full Digi-Block
Activity

B

Multiply to Divide

OBJECTIVES:

- To model and explain division as the inverse of multiplication
- To write number sentences to show the division/multiplication relationship of three given numbers

summary

materials



Digi-Block Overview

- Students use Digi-Blocks to model and describe the relationship among **factors, products, and quotients**.
- They play a game to practice identifying number families.

Students need:

- about 50 single blocks and holders
- array platforms
- *All in the Family* activity sheet
- number cards pre-cut for whole class demonstration (See Figure 1.)



Everyday Math Connection

- This lesson complements *Everyday Mathematics* Lesson 11.7, “Multiplication/Division Fact Families.” Students use Digi-Blocks to model the relationship between multiplication and division. They show equal sets and an array which can be separated evenly.
- Students work with concrete models to help them visualize the relationship between the operations. This serves as a good transition to Fact Triangle cards, which reflect the same concepts but in a more abstract way.

2	3	6	45	4	8
2	5	10	2	50	12
2	7	14	2	8	16
5	9	18	7	10	20
5	3	15	5	4	20
35	40	25	5	6	30

Write the numbers shown above on inch graph paper. Cut along the lines to make Number Cards.

The numbers on these cards make fact families with 2 and 5 as factors, as Lesson 11.7 suggests.

Figure 1



Class Introduction

20 min

- Tell the story:

David and Sarah were solving this problem:

$$24 \div 6$$

David took 24 blocks and began separating them into 6 equal shares.

- Ask students,

How was David solving the problem? Would his way work?

- Continue the story:

Sarah held up her fingers and counted, “6, 12, 18, 24! The answer is 4 because 6×4 is 24!” she said.

- Ask students,

What was Sarah’s thinking? Did her way work?

Discuss students’ responses.

- Refer to the David’s and Sarah’s strategies and explain to students that we can use what we know about multiplication to help us solve division problems. This lesson focuses on how multiplication and division are related.
- Write

$$24 \div 6 = 4$$

$$6 \times 4 = 24$$

How are these facts related?

- Have small groups or partners use single blocks to model the inverse relationship between the two facts.
 - First, have students build 24 with blocks, making 2 blocks-of-10 and 4 single blocks. Model 24 divided into 6 groups (sharing model). Have another student model 6 groups of 4. Students will observe that the models are very similar!
 - Have students arrange 24 blocks to make a 6×4 rectangle. Show 6 columns of 4 (or 4 columns of 6). Next, divide the array using paper strips by making 6 equal groups.
- Repeat the process with another example, such as

$$35 \div 7 = 5$$

$$7 \times 5 = 35$$

- Discuss how knowing a multiplication fact can help name a division fact.
 - Have students name related division facts for several multiplication facts, such as:

$4 \times 5 = 20$	$(20 \div 5 = 4 \text{ or } 20 \div 4 = 5)$
$3 \times 9 = 27$	$(27 \div 3 = 9 \text{ or } 27 \div 9 = 3)$
$5 \times 3 = 15$	$(15 \div 3 = 5 \text{ or } 15 \div 5 = 3)$

- Next, have students name related multiplication facts:

$$12 \div 4 = 3$$

$$25 \div 5 = 5$$

$$36 \div 4 = 9$$

$$(4 \times 3 = 12 \text{ or } 3 \times 4 = 12)$$

$$(5 \times 5 = 25)$$

$$(9 \times 4 = 36 \text{ or } 4 \times 9 = 36)$$

- Introduce vocabulary used in multiplication and division facts and how the terms are related. Write:

factor \times **factor** = **product**
dividend \div **divisor** = **quotient**
product \div **factor** = **factor**
quotient \times **divisor** = **dividend**

- Have students name several multiplication and division facts. Identify the numbers in each using the given vocabulary.
- Summarize the lesson, explaining that if students know their multiplication facts, they also know their division facts!



Pair or Independent Practice 20 min

- Introduce the game, “All in the Family” to practice naming related fact families. Have two student volunteers demonstrate the game.
- Both players combine their cards in a cup.
 - Each player draws 5 cards from the cup. If a player has a set of 3 related numbers, he or she records them and writes a multiplication and division fact to show how they are related. When a number family is made, the three cards are returned to the cup.
 - If a set cannot be made, the player keeps the numbers and his or her turn is over.
 - Players continue to draw cards until both players have made and recorded at least 6 sets of related numbers.



Closure 5 min

- Have students share some of the number families they recorded during the game.

Name _____

All In The Family

ACTIVITY SHEET

1. Start the game by drawing 5 number cards from the cup.
2. If you have 3 cards that make a family, record the related facts.
3. If you can't make a family, your turn is over.
4. Take turns drawing one more card from the cup to add to your collection.
5. Play until all players have made and recorded 3 fact families.

Family 1

$\square \times \square = \square$	$\square \times \square = \square$
$\square \div \square = \square$	$\square \div \square = \square$

Family 2

$\square \times \square = \square$	$\square \times \square = \square$
$\square \div \square = \square$	$\square \div \square = \square$

Family 3

$\square \times \square = \square$	$\square \times \square = \square$
$\square \div \square = \square$	$\square \div \square = \square$

DB-82 Unit 11 Activity B Multiply to Divide Student Book p. 33

Assessment

As students work, observe and note, do they:

- ✓ Model multiplication and division with materials (groups of blocks, arrays)?
- ✓ Understand the relationship among factors, products, and quotient?
- ✓ Name related multiplication or division facts?
- ✓ Identify factors, product, quotient?

Name _____

All In The Family

1. Start the game by drawing 5 number cards from the cup.
2. If you have 3 cards that make a family, record the related facts.
3. If you can't make a family, your turn is over.
4. Take turns drawing one more card from the cup to add to your collection.
5. Play until all players have made and recorded 3 fact families.

Family 1

$$\square \times \square = \square$$

$$\square \times \square = \square$$

$$\square \div \square = \square$$

$$\square \div \square = \square$$

Family 2

$$\square \times \square = \square$$

$$\square \times \square = \square$$

$$\square \div \square = \square$$

$$\square \div \square = \square$$

Family 3

$$\square \times \square = \square$$

$$\square \times \square = \square$$

$$\square \div \square = \square$$

$$\square \div \square = \square$$