



Multiplication and Division

Unit 4 focuses on the most common uses of multiplication and division—problems that involve equal sharing and equal grouping. In *Second Grade Everyday Mathematics*, children were exposed to multiplication and division number stories and multiplication and division facts. To solve multiplication and division number stories, children will refer to familiar strategies introduced in second grade:

- ◆ **Acting out problems using concrete objects, such as counters** (below)



$$3 \times 4 = 12$$



$$2 \times 7 = 14$$

- ◆ **Using diagrams to sort out quantities** (below)

children	pennies per child	pennies in all
4	?	28

- ◆ **Using number models to represent solution strategies** (below)

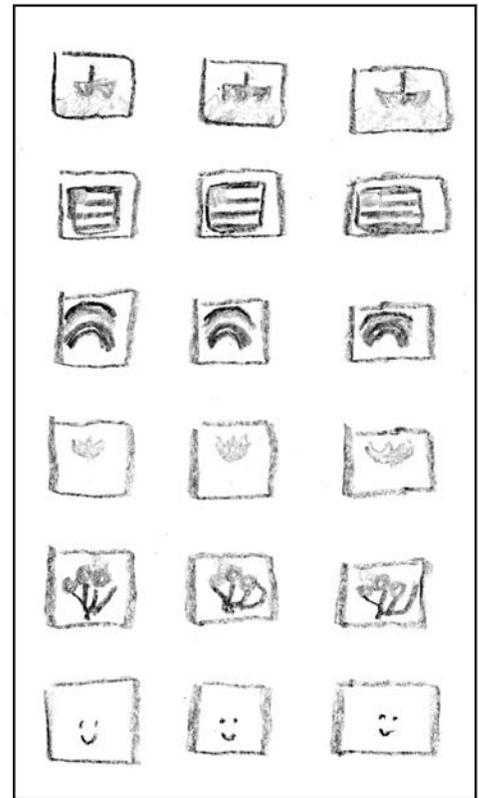
Problem:

Each child has 2 apples.
There are 16 apples. How many children have apples?

Solution strategies:

$2 \times ? = 16$, or I know that $16 \div 2 = 8$.
If there are 16 apples and each child has 2, then there must be 8 children.

- ◆ **Representing problems with pictures and arrays** (below)



A sheet of stamps has 6 rows. Each row has 3 stamps. How many stamps are on a sheet?

$$6 \times 3 = 18$$

Vocabulary

Important terms in Unit 4:

multiples of a number The product of the number and a counting number. For example, multiples of 2 are 2, 4, 6, and 8....

multiplication/division diagram In *Everyday Mathematics*, a diagram used to represent problems in which the total number of objects in several equal groups is being considered. The diagram has three parts: number of groups, number in each group, and total number. For example, the multiplication/division diagram here represents this number story: There are 3 boxes of crayons. Each box has 8 crayons. There are 24 crayons in all.

boxes	crayons per box	crayons
3	8	24

rectangular array

A group of objects placed in rows and columns.



A 2-by-6 array of eggs

factor Each of the two or more numbers in a product.

In $4 \times 3 = 12$,
4 and 3 are the **factors**,
and 12 is the **product**.

product The result of multiplying two numbers.

equal groups Sets with the same number of elements, such as tables with 4 legs, rows with 6 chairs, boxes of 100 paper clips, and so on.

dividend The number in division that is being divided.

divisor In division, the number that divides another number, the *dividend*.

quotient The result of division.

In $28 \div 4 = 7$,
28 is the **dividend**,
4 is the **divisor**, and
7 is the **quotient**.

remainder An amount left over when one number is divided by another number. In the division number model $16 \div 3 \rightarrow 5 \text{ R}1$, the remainder is 1.

square number

The product of a number multiplied by itself; any number that can be represented

• • • $3 \times 3 = 9$
• • • The number 9 is a
• • • **square number**.

by a square array of dots or objects. A square array has the same number of rows as columns.

Building Skills through Games

In Unit 4, your child will practice division and multiplication by playing the following games. For detailed instructions, see the *Student Reference Book*.

Division Arrays

Players make arrays with counters. They use number cards to determine the number of counters and a toss of a die to establish the number of rows.

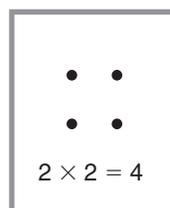
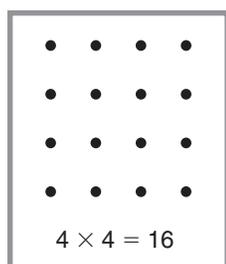
Beat the Calculator

A Calculator (a player who uses a calculator) and a Brain (a player who solves the problem without a calculator) compete to see who will be first to solve multiplication problems.

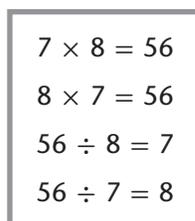
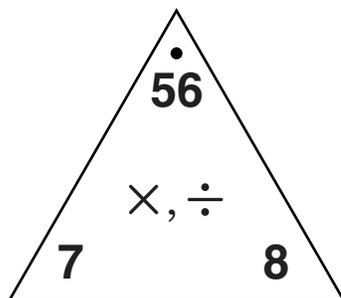
Do-Anytime Activities

To work with your child on concepts taught in this unit and in previous units, try these interesting and rewarding activities:

- Together with your child, sort objects into equal groups. Discuss what you could do with any leftover objects.
- Review multiplication-fact shortcuts:
 - ◆ **turn-around facts** The order of the factors does not change the product. Thus, if you know $3 \times 4 = 12$, you also know $4 \times 3 = 12$.
 - ◆ **multiplication by 1** The product of 1 and another number is always equal to the other number. For example, $1 \times 9 = 9$; $1 \times 7 = 7$.
 - ◆ **multiplication by 0** The product of 0 and another number is always 0. For example, $4 \times 0 = 0$; $0 \times 2 = 0$.
 - ◆ **square numbers** Arrays for numbers multiplied by themselves are always squares. For example, 2×2 and 4×4 are square numbers.



- Use the \times , \div Fact Triangles (a set will be sent home later) to practice the basic facts. Act as a partner by covering one number on the card and then asking your child to create a multiplication or division number model using the other two numbers.



- Write any number—for example, 34,056. Then ask questions like the following:
How many are in the thousands place? (4) What is the value of the digit 5? (50)
- Ask questions like the following:
Is $467 + 518$ more or less than 1,000? (*less*) Is $754 - 268$ more or less than 500? (*less*)

As You Help Your Child with Homework

As your child brings home assignments, you might want to go over the instructions together, have your child explain the activities, and clarify them as necessary. The answers listed below will guide you through this unit's Home Links.

Home Link 4•1

1. $5 \times 6 = ?$; 30 apples

Home Link 4•2

1. 24 counters
2. 24 counters
3. 24 counters
4. 358
5. 204
6. 428

Home Link 4•3

1. 5 counters per person; 0 counters remaining
2. 2 counters per person; 5 counters remaining
3. 4 weeks in January; 3 days remaining
4. 4 teams; 2 children remaining
5. 2 pencils; 4 pencils left over
6. 11 jelly beans; 0 jelly beans left over
7. 577
8. 31
9. 801

Home Link 4•4

1. 6 marbles; 0 marbles left over
2. 2 cookies; 1 cookie left over
3. 4 complete rows; 6 stamps left over

Home Link 4•5

1. 10; 10
2. 15; 15
3. 20; 20
4. 9; 9
5. 90; 90
6. 365; 365
7. 0; 0
8. 0; 0
9. 0; 0
10. 20
11. 20
12. 18
13. 14
14. 15
15. 50

Home Link 4•6

1. 10; 10; 10; 10
2. 12; 12; 12; 12
3. $2 \times 7 = 14$; $7 \times 2 = 14$;
 $14 \div 2 = 7$; $14 \div 7 = 2$
4. $2 \times 8 = 16$; $8 \times 2 = 16$;
 $16 \div 2 = 8$; $16 \div 8 = 2$

5. $5 \times 4 = 20$; $4 \times 5 = 20$;
 $20 \div 5 = 4$; $20 \div 4 = 5$

6. $10 \times 6 = 60$; $6 \times 10 = 60$;
 $60 \div 10 = 6$; $60 \div 6 = 10$

Home Link 4•7

1. $5 \times 6 = 30$; $6 \times 5 = 30$;
 $30 \div 6 = 5$; $30 \div 5 = 6$

2. $8 \times 3 = 24$; $3 \times 8 = 24$;
 $24 \div 3 = 8$; $24 \div 8 = 3$

3. $2 \times 9 = 18$; $9 \times 2 = 18$;
 $18 \div 2 = 9$; $18 \div 9 = 2$

4. $4 \times 7 = 28$; $7 \times 4 = 28$;
 $28 \div 7 = 4$; $28 \div 4 = 7$

5. $9 \times 8 = 72$; $8 \times 9 = 72$;
 $72 \div 9 = 8$; $72 \div 8 = 9$

6. $6 \times 7 = 42$; $7 \times 6 = 42$;
 $42 \div 7 = 6$; $42 \div 6 = 7$

Home Link 4•8

1. 7; 5; $7 \times 5 = 35$; 35 square units
2. 6; 7; $6 \times 7 = 42$; 42 square units
3. $4 \times 8 = 32$
4. $9 \times 5 = 45$

Home Link 4•9

The following answers should be circled:

1. more than the distance from Chicago to Dallas;
about 2,400 miles
2. about 600 miles;
less than the distance from Chicago to Denver
3. more than the distance from New York to
Chicago
4. less than the distance from Denver to Atlanta;
more than the distance from New York to
Portland; about 750 miles