

# North Dakota NDSA Grade 3 Math All-in-One

*Complete Lessons, Examples, Practice & Answer Key*

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WELCOME TO

# Grade 3 Math Made Easy!



Hi there, math superstar! ★

This book is **your** guide to all the amazing math you'll learn in Grade 3. Inside, you'll discover numbers, multiplication, fractions, shapes, and so much more!

✓ Math can be **fun**!

✓ You **can** do this!

✓ Mistakes help you **learn**!

Are you ready? Let's go! 🚀

“ I'm Owlbert, your math buddy! I'll be here to help you every step of the way! ”



# *How to Use This Book*

*Look for these special boxes as you read!*

## *Learning Goals*

*At the start of every topic, you'll see what you're about to learn. These are your targets!*

## *Concept Boxes*

*The big idea! This is where you'll learn new math concepts. Read these carefully.*

## *Worked Examples*

*Watch how problems are solved step by step. Follow along and try them yourself!*

## *Practice Problems*

*Your turn! Try these problems on your own. Check your answers at the back of the book.*



## *Owlbert Says*

*Your owl buddy shares tips, tricks, and encouragement. Listen to Owlbert!*

## *Tips & Hints*

*Helpful shortcuts and tricks to make math easier. Look for these throughout the book!*



## *Fun Facts*

*Cool things about math in the real world. Math is everywhere around you!*



## *Watch Out!*

*Common mistakes to avoid. Everyone makes them — but now you won't!*

✓ **Answers** to all practice problems are in the **Answer Key** at the back of the book!

PREVIEW



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# What Math Topics Will You Learn?

## Number Sense

- Place Value
- Comparing & Ordering
- Rounding
- Even & Odd Numbers

## Addition & Subtraction

- Adding 3-Digit Numbers
- Subtracting 3-Digit
- Adding 4-Digit Numbers
- Subtracting 4-Digit
- Estimating Sums & Differences

## Multiplication

- Understanding Multiplication
- Facts 0–5
- Facts 6–10
- Multiplying by 10 & 100

## Division

- Understanding Division
- Division Facts
- Relating  $\times$  &  $\div$

## Fractions

- Understanding Fractions
- Fractions on Number Line
- Comparing Fractions
- Equivalent Fractions

## Measurement

- Measuring Length
- Weight & Capacity
- Telling Time
- Elapsed Time

## Money

- Counting Money
- Adding & Subtracting Money

## Geometry

- 2D Shapes & Attributes
- 3D Shapes
- Perimeter
- Area

## Data & Graphs

- Picture Graphs
- Bar Graphs
- Line Plots

## Patterns & Problem Solving

- Number Patterns
- Word Problems

# X<sup>1</sup> Math Symbols You Should Know X<sup>1</sup>

*You'll see these symbols throughout this book!*

| Symbol        | Name             | What It Means                                               |                   |
|---------------|------------------|-------------------------------------------------------------|-------------------|
| +             | Plus (Add)       | Put numbers together.                                       | $3 + 5 = 8$       |
| -             | Minus (Subtract) | Take away from a number.                                    | $9 - 4 = 5$       |
| ×             | Times (Multiply) | Add equal groups.                                           | $4 \times 3 = 12$ |
| ÷             | Divide           | Split into equal groups.                                    | $12 \div 3 = 4$   |
| =             | Equals           | Both sides are the same.                                    | $2 + 3 = 5$       |
| >             | Greater Than     | The left number is bigger.                                  | $7 > 3$           |
| <             | Less Than        | The left number is smaller.                                 | $2 < 9$           |
| $\frac{1}{2}$ | Fraction Bar     | Part of a whole. $\frac{1}{2}$ means 1 out of 2 equal parts |                   |

## “ Remember the Alligator! ”



The **greater than** (>) and **less than** (<) symbols are like an alligator's mouth. The alligator always wants to eat the **bigger** number!

$$8 > 3$$

8 is greater than 3

$$2 < 9$$

2 is less than 9



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 **Key Math Words for Grade 3**

- **Sum** — the answer when you add
- **Difference** — the answer when you subtract
- **Product** — the answer when you multiply
- **Quotient** — the answer when you divide
- **Factor** — a number you multiply
- **Array** — objects in rows and columns
- **Fraction** — a part of a whole
- **Numerator** — the top number in a fraction
- **Denominator** — the bottom number
- **Equation** — a math sentence with =
- **Estimate** — a smart guess, close to the real answer
- **Perimeter** — the distance around a shape
- **Area** — the space inside a shape
- **Rounding** — making a number simpler by going to the nearest ten or hundred



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PREVIEW

CHAPTER

1

## *Number Sense & Place Value*

### ★ *What's Inside* ★

|                                                           |          |
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## ★ 1.1 Place Value: Ones, Tens, Hundreds ★

### 🎯 In this lesson you will learn:

- Understand that digits have different values based on their position
- Identify the ones, tens, and hundreds places
- Write numbers in expanded form

What does the digit 3 mean in the number 345?



Owl

It means 3!



You

Not quite! It means 300 because it's in the **hundreds** place!



Owl

### 🎓 What Is Place Value?

**Place value** tells us how much a digit is worth based on where it sits in a number. The same digit can mean different things!

Look at the number 527:

| H | T | O |
|---|---|---|
| 5 | 2 | 7 |



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- The **5** is in the **hundreds** place. It means 500.
- The **2** is in the **tens** place. It means 20.
- The **7** is in the **ones** place. It means 7.

So  $527 = 500 + 20 + 7$ .

### Place Value Words

**Digit** — A single number symbol: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

**Place Value** — The value of a digit based on its position in a number.

**Expanded Form** — A way to write a number showing the value of each digit.



“ Think of place value like a house! Ones live on the first floor; tens on the second floor; and hundreds on the top floor. The higher the floor, the bigger the value! ”

### Show 364 with Base-Ten Blocks

Let's break apart 364:



1. 3 hundreds = 300 (the big flat squares)
2. 6 tens = 60 (the long rods)
3. 4 ones = 4 (the tiny cubes)

✓ **Answer:**  $364 = 300 + 60 + 4$



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 **Expanded Form of 892**

*Let's expand it:*

1. The 8 is in the hundreds place: 800
2. The 9 is in the tens place: 90
3. The 2 is in the ones place: 2

✓ **Answer:**  $892 = 800 + 90 + 2$

 **Your Turn!** Write 476 in expanded form: \_\_\_\_\_

 **Math in Real Life!**

When you see a price tag that says \$2.49, place value helps you understand it means 2 dollars, 4 dimes, and 9 pennies!

 **Let's Explore!**

*Digit Detective* Look at the number **753**. Answer these questions:

- Which digit is in the hundreds place? \_\_\_\_\_
- Which digit is in the tens place? \_\_\_\_\_
- Which digit is in the ones place? \_\_\_\_\_
- What is the value of the digit 5? \_\_\_\_\_

Now try the number **308**:



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- What does the 0 mean? \_\_\_\_\_
- Write 308 in expanded form: \_\_\_\_\_

**TIP**

A 0 in a number is a placeholder. In 308, the 0 means there are zero tens. We write:  
 $308 = 300 + 0 + 8$ .



### Oops! Find the Mistake!

What Went Wrong? Maria says the value of the digit 6 in **461** is 6.

Is Maria correct? \_\_\_\_\_

The 6 is in the \_\_\_\_\_ place, so its value is \_\_\_\_\_.



### What We Learned

- Every digit in a number has a **place value**.
- The three places are: **hundreds, tens, and ones**.
- **Expanded form** shows the value of each digit:  $547 = 500 + 40 + 7$ .
- A 0 means there are none of that place value, but it holds the spot!



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 **Place Value Practice** **What Is the Value?**

Write the value of the underlined digit.

1.  $\underline{3}82$  \_\_\_\_\_

4.  $\underline{9}15$  \_\_\_\_\_

2.  $5\underline{6}1$  \_\_\_\_\_

5.  $2\underline{4}7$  \_\_\_\_\_

3.  $7\underline{0}4$  \_\_\_\_\_

6.  $63\underline{8}$  \_\_\_\_\_

**Write in Expanded Form**

7.  $259 =$  \_\_\_\_\_

8.  $730 =$  \_\_\_\_\_

9.  $406 =$  \_\_\_\_\_

10.  $815 =$  \_\_\_\_\_

**Write the Number**

Write the standard form.

11.  $600 + 30 + 9 =$  \_\_\_\_\_

12.  $200 + 50 + 1 =$  \_\_\_\_\_

13.  $400 + 0 + 7 =$  \_\_\_\_\_

14.  $100 + 80 + 0 =$  \_\_\_\_\_

**True or False?**

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15. In 347, the digit 4 has a value of 40.

True ☐ False ☐

16. In 902, the digit 0 has a value of 0.

True ☐ False ☐

17. In 618, the digit 6 is in the tens place.

True ☐ False ☐

18.  $500 + 70 + 3 = 573$

True ☐ False ☐

### Word Problems

19. Lily has 3 hundred-dollar bills, 5 ten-dollar bills, and 2 one-dollar bills. How much money does Lily have?

Answer: \_\_\_\_\_ dollars

20. A school has 648 students. What is the value of the digit 4 in 648?

Answer: \_\_\_\_\_



### Challenge! ★

21. I am a 3-digit number. My hundreds digit is 7. My tens digit is 2 more than my ones digit. My ones digit is 3. What number am I? \_\_\_\_\_

22. Use the digits 4, 8, and 1 to make the largest possible 3-digit number: \_\_\_\_\_

Now make the smallest possible 3-digit number: \_\_\_\_\_



★ **Awesome work! You now know that every digit has a special place and value!** ★



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CHAPTER

2

## *Multiplication & Division*

### ★ *What's Inside* ★

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|----------------------------------------|---|



## ★ 2.1 Understanding Multiplication ★

### 🎯 In this lesson you will learn:

- Understand multiplication as equal groups
- Read and write multiplication sentences
- Use pictures and arrays to show multiplication

### 📖 The Cookie Trays

Emma is setting up for a party. She puts 4 cookies on each tray. She fills 3 trays. How many cookies does she have?

You could count:  $4 + 4 + 4 = 12$ .

But there's a faster way — **multiplication!**

**Multiplication = Counting Equal Groups!**

### 🎓 What Is Multiplication?

**Multiplication** is a quick way to add **equal groups**.

$3 \times 4$  means "3 groups of 4"



$$3 \times 4 = 12$$



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Instead of adding  $4 + 4 + 4$ , we multiply!

### Math Words

**Factor** — The numbers you multiply. In  $3 \times 4 = 12$ , the factors are 3 and 4.

**Product** — The answer when you multiply. In  $3 \times 4 = 12$ , the product is 12.

**Equal Groups** — Groups that all have the same number of items.



“ Think about it this way:  $5 \times 7$  means “5 groups of 7.” The first number tells you HOW MANY groups. The second tells you HOW MANY in each group! ”

### Reading a Multiplication Sentence

$$\underbrace{5}_{\text{groups}} \times \underbrace{7}_{\text{in each}} = \underbrace{35}_{\text{total}}$$

We say: “Five **times** seven equals thirty-five.”

Or: “Five **groups of** seven.”

### Show $2 \times 6$

$2 \times 6$  means 2 groups of 6:



$$2 \times 6 = 6 + 6 = 12$$

✓ **Answer:**  $2 \times 6 = 12$



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### Show $4 \times 5$ with an Array

An **array** shows multiplication as rows and columns:



4 rows with 5 in each row.

✔ **Answer:**  $4 \times 5 = 20$

#### Equal Groups



3 groups of 4

Groups are circles of dots.

$$3 \times 4 = 12$$

#### Arrays



3 rows, 4 columns

Dots are lined up in a grid.

$$3 \times 4 = 12$$

 **Your Turn!** Draw 5 groups of 3 dots. What is  $5 \times 3$ ? \_\_\_\_\_

### Multiplication = Repeated Addition

Every multiplication can be written as addition:



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$$\begin{array}{rcl}
 3 \times 5 & = & 5 + 5 + 5 = 15 \\
 4 \times 2 & = & 2 + 2 + 2 + 2 = 8 \\
 6 \times 3 & = & 3 + 3 + 3 + 3 + 3 + 3 = 18
 \end{array}$$

*But multiplication is much faster!*

### Let's Explore!

*Skip Counting and Multiplication Skip counting is multiplication in disguise!*



*Counting by 5s: 5, 10, 15, 20, 25, 30*

*The 6th number is 30. That means  $6 \times 5 = 30$ !*

*Now skip count by 3s to find  $4 \times 3$ :*

3, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

So  $4 \times 3 =$  \_\_\_\_\_

#### TIP

*You can use skip counting to multiply! To find  $7 \times 2$ , count by 2s seven times:  
2, 4, 6, 8, 10, 12, 14*

### Math in Real Life!

*Multiplication is everywhere!*

- 6 eggs in each row, 2 rows in a carton:  $2 \times 6 = 12$  eggs
- 4 wheels on each car, 5 cars:  $5 \times 4 = 20$  wheels
- 3 scoops per cone, 7 cones:  $7 \times 3 = 21$  scoops



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**Oops! Find the Mistake!**

Jake says  $3 \times 5 = 8$ .

What did Jake do wrong? \_\_\_\_\_

Hint: Did Jake add or multiply?

The correct answer is: \_\_\_\_\_

**What We Learned**

- **Multiplication** means counting **equal groups**.
- $a \times b$  means “ $a$  groups of  $b$ .”
- The numbers being multiplied are **factors**. The answer is the **product**.
- You can show multiplication with **equal groups**, **arrays**, **skip counting**, or **repeated addition**.



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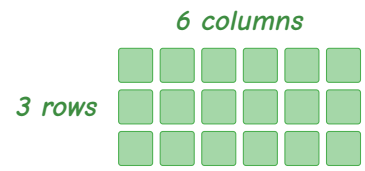
## ✎ Multiplication Practice ✎

### Write the Multiplication Sentence

Look at the groups and write a multiplication sentence.

1.  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

2.  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

3.  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

### Write as Repeated Addition AND Multiplication

4.  $4 + 4 + 4 =$  \_\_\_\_\_  $\rightarrow$  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

5.  $7 + 7 =$  \_\_\_\_\_  $\rightarrow$  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

6.  $6 + 6 + 6 + 6 + 6 =$  \_\_\_\_\_  $\rightarrow$  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

### Multiply

7.  $2 \times 4 =$  \_\_\_\_\_

10.  $4 \times 5 =$  \_\_\_\_\_

8.  $3 \times 3 =$  \_\_\_\_\_

11.  $1 \times 8 =$  \_\_\_\_\_

9.  $5 \times 2 =$  \_\_\_\_\_

12.  $6 \times 2 =$  \_\_\_\_\_

### Word Problems



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13. There are 5 bags with 4 apples in each bag. How many apples are there in all?

**Answer:** \_\_\_\_\_ apples

14. A parking lot has 3 rows of cars. Each row has 6 cars. How many cars are in the lot?

**Answer:** \_\_\_\_\_ cars

15. Ms. Lee gives each of her 7 students 2 stickers. How many stickers does she give out?

**Answer:** \_\_\_\_\_ stickers

### Hands-On Activity!

*Build Arrays! Use small objects (coins, blocks, or cereal pieces).*

1. Build an array with 3 rows and 5 columns. How many total? \_\_\_\_\_
2. Build an array with 4 rows and 4 columns. How many total? \_\_\_\_\_
3. Can you build TWO different arrays that both have 12 objects? Draw them!

★ You just learned one of the most powerful  
tools in math — multiplication! Way to go! ★



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THANK YOU

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