

# Indiana ILEARN Grade 5 Math All-in-One

*Complete Lessons, Examples, Practice & Answer Key*

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WELCOME TO

# Grade 4 Math Made Easy!

Hi there, math superstar! ★

This book is **your** guide to all the amazing math you'll learn in Grade 4. 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! ”



CHAPTER

1

# Place Value & Decimals

## ★ What's Inside ★

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## ★ 1.1 Place Value Relationships ★

### ★ Place Value Relationships ★

#### 🕒 In this lesson you will learn:

- Understand how each digit in a number gets its value from its **position**
- See that a digit is 10 times the value of the same digit one place to its right
- See that a digit is  $\frac{1}{10}$  the value of the same digit one place to its left
- Use place value charts for whole numbers and decimals

Did you know that the digit 5 can be worth 5, or 50, or 500, or even 0.5? It all depends on **where** it sits in the number!

Owl

Wait — the same digit can mean totally different things?

You

Yep! That's the magic of **place value**. Let's explore it together!

Owl



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## Place Value Words

**Digit** — One of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 used to write numbers.

**Place** — The position of a digit in a number (ones, tens, hundreds, ...).

**Value** — How much a digit is worth because of its place.

## The Big Idea: Every Place Is 10 Times!

Look at this place value chart. Each place is 10 **times** the place to its right:

Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
100	10	1		0.1	0.01	0.001

- Moving **left** one place: the value gets **10 times bigger**.
- Moving **right** one place: the value gets **10 times smaller** (that's the same as  $\frac{1}{10}$ ).



“ Think of it like a **zoom lens**. Move left and everything gets 10× bigger. Move right and everything shrinks to  $\frac{1}{10}$  the size! ”

## What Is the 5 Worth?

Look at the number **5,555.555**. Every digit is a 5, but each one has a **different value**!



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<i>Th</i>	<i>H</i>	<i>T</i>	<i>O</i>	.	<i>tenths</i>	<i>hundredths</i>	<i>thousandths</i>
5	5	5	5	.	5	5	5
5,000	500	50	5		0.5	0.05	0.005

**Solution:**

- The 5 in the **thousands** place is worth 5,000.
- The 5 in the **hundreds** place is worth 500.
- 5,000 is 10 **times** 500. And 500 is  $\frac{1}{10}$  of 5,000.
- This  $\times 10$  pattern keeps going all the way to the thousandths!

**Let's Explore!**

Discover the  $\times 10$  Pattern

Fill in the blanks to see the pattern yourself!

$$1,000 \div 10 = \underline{\hspace{2cm}} \qquad 100 \times 10 = \underline{\hspace{2cm}}$$

$$100 \div 10 = \underline{\hspace{2cm}} \qquad 10 \times 10 = \underline{\hspace{2cm}}$$

$$10 \div 10 = \underline{\hspace{2cm}} \qquad 1 \times 10 = \underline{\hspace{2cm}}$$

$$1 \div 10 = \underline{\hspace{2cm}} \qquad 0.1 \times 10 = \underline{\hspace{2cm}}$$

$$0.1 \div 10 = \underline{\hspace{2cm}} \qquad 0.01 \times 10 = \underline{\hspace{2cm}}$$

What do you notice? \_\_\_\_\_



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 **How Do Two Digits Compare?**

In the number 4,440:

The 4 in the **thousands** place = 4,000.

The 4 in the **hundreds** place = 400.

The 4 in the **tens** place = 40.

**How are they related?**

1. 4,000 is  $10 \times$  400.
2. 400 is  $10 \times$  40.
3. Going the other way: 40 is  $\frac{1}{10}$  of 400.
4. And 400 is  $\frac{1}{10}$  of 4,000.

 **Answer:** Each 4 is  $10 \times$  the 4 to its right!

 **Decimals Follow the Same Rule!**

In the number 0.777:

- The 7 in the **tenths** place = 0.7.
- The 7 in the **hundredths** place = 0.07.
- The 7 in the **thousandths** place = 0.007.

**Solution:**

0.7 is **10 times** 0.07. And 0.07 is **10 times** 0.007.

Going the other way: 0.007 is  $\frac{1}{10}$  of 0.07, and 0.07 is  $\frac{1}{10}$  of 0.7.

 **Answer:** The  $\times 10$  and  $\div 10$  pattern works for decimals too!



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 **Math in Real Life!**

When you count money, you use place value every day!

- A **dime** (\$0.10) is 10 times a **penny** (\$0.01).
- A **dollar** (\$1.00) is 10 times a **dime**.
- A **ten-dollar bill** is 10 times a **dollar**.

Same pattern —  $\times 10$  each time you move left!

**Think About It!**

If you have 3 in the hundreds place, how many times greater is it than a 3 in the ones place? What about a 3 in the tenths place?

 **TIP**

To compare two digits in different places, count how many places apart they are. Each place apart means another  $\times 10$  (or  $\div 10$ ).

 **Math Riddle!**

I am a 4-digit number. All my digits are the same. If you look at my **thousands** digit and my **ones** digit, the thousands digit is worth 1,000 times as much! What is the smallest number I could be?

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



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16. In 2.22, the 2 in the hundredths place is 100 times the 2 in the ones place. True  False

Word Problems

17. Maya writes the number 7,770.77. How many times greater is the 7 in the thousands place than the 7 in the tens place?

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

18. Jake says, "The 5 in 0.05 is worth the same as the 5 in 0.50." Is Jake correct? Explain.

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

19. Liam has \$500 in the bank. Emma has \$50. How many times more money does Liam have than Emma?

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

 Challenge! 

1. In the number 9,999.999, how many times greater is the 9 in the **thousands** place than the 9 in the **thousandths** place? \_\_\_\_\_

2. A place value chart goes from thousandths on the right to thousands on the left. How many times bigger is the thousands place compared to the thousandths place? \_\_\_\_\_ 

 You just mastered the  $\times 10$  secret  
of place value — awesome work! 



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CHAPTER

2

# Operations with Decimals

## ★ What's Inside ★

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## ★ 2.1 Add Decimals ★

### ★ Add Decimals ★

#### 🎯 In this lesson you will learn:

- Add decimals to the **hundredths** place
- Line up **decimal points** before adding
- Use models, drawings, and the **standard algorithm** to add decimals
- Annex zeros as placeholders when needed

#### 📖 At the School Store

Emma buys a notebook for \$3.45 and a pack of markers for \$2.30. How much does she spend in all?

To find out, we need to **add decimals!** Let's learn how.

#### Decimal Addition Words

**Decimal point** — The dot that separates the whole-number part from the fractional part.

**Annex zeros** — Adding zeros to the end of a decimal so both numbers have the same number of decimal places. 3.5 becomes 3.50.

**Regroup** — When a column adds up to 10 or more, carry the extra to the next column — just like with whole numbers!



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 **The Big Rule: Line Up the Decimal Points!**

Adding decimals works **exactly** like adding whole numbers. The only extra step is:

*Always line up the decimal points  
so that digits with the same place  
value are in the same column!*

$$\begin{array}{r} \text{O.} \text{th} \\ 3.45 \\ +2.30 \\ \hline 5.75 \end{array}$$

Ones with ones. Tenths with tenths. Hundredths with hundredths. Then add each column from right to left!



“ Think of the decimal point as a **traffic cone** in the middle of the road. Everything lines up on either side of it! ”

 **How to Add Decimals**

- 1 Write the numbers vertically. Line up the **decimal points**.



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- 2 **Annex zeros** if needed so both numbers have the same number of decimal places.
- 3 **Add** each column from right to left, just like whole numbers.
- 4 **Regroup** (carry) when a column totals 10 or more.
- 5 **Bring down** the decimal point into the answer.

### Add $4.73 + 2.15$

#### Solution:

1. Line up the decimal points:

$$\begin{array}{r}
 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\
 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\
 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\
 + \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\
 \hline
 \phantom{0} \phantom{0} \phantom{0} \phantom{0}
 \end{array}$$

1. Hundredths:  $3 + 5 = 8$ .
2. Tenths:  $7 + 1 = 8$ .
3. Ones:  $4 + 2 = 6$ .
4. Bring down the decimal point.

 **Answer:**  $4.73 + 2.15 = 6.88$



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 **Add  $5.6 + 3.87$  (Different Number of Decimal Places)**

**Solution:**

1.  $5.6$  has one decimal place and  $3.87$  has two. Annex a zero:  $5.6 \rightarrow 5.60$ .
2. Now line up and add:

$$\begin{array}{r}
 \phantom{+} \overset{0}{0} \overset{1}{0} 5 \\
 + 0 0 3 \\
 \hline
 0 0 9
 \end{array}$$

1. Hundredths:  $0 + 7 = 7$ .
2. Tenths:  $6 + 8 = 14$ . Write 4, carry 1.
3. Ones:  $5 + 3 + 1 = 9$ .

 **Answer:**  $5.6 + 3.87 = 9.47$

 **TIP**

Annexing zeros doesn't change the number's value!  $5.6 = 5.60 = 5.600$ . It just helps you keep the columns lined up.

 **Add  $12.95 + 8.67$  (Regrouping in Multiple Columns)**

**Solution:**



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$$\begin{array}{r}
 \phantom{+} \overset{1}{0} \overset{1}{1} 2 \\
 + 0 0 8 \\
 \hline
 0 2 1
 \end{array}$$

1. *Hundredths:*  $5 + 7 = 12$ . Write 2, carry 1.
2. *Tenths:*  $9 + 6 + 1 = 16$ . Write 6, carry 1.
3. *Ones:*  $2 + 8 + 1 = 11$ . Write 1, carry 1.
4. *Tens:*  $1 + 0 + 1 = 2$ .

✓ **Answer:**  $12.95 + 8.67 = 21.62$

### See It with Base-Ten Blocks

Imagine adding  $1.34 + 0.52$  using blocks:

$$\begin{array}{r}
 \boxed{100} \quad \text{|||} \quad \dots \\
 + \quad \text{|||} \quad \dots
 \end{array}$$

Combine the blocks!

1. **Flats (ones):**  $1 + 0 = 1$
2. **Rods (tenths):**  $3 + 5 = 8$
3. **Units (hundredths):**  $4 + 2 = 6$

$$\boxed{100} \quad \text{|||||} \quad \dots$$



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$$\checkmark \text{ Answer: } 1.34 + 0.52 = 1.86$$

### 🔍 Let's Explore!

*Adding with Hundredths Grids*

A **hundredths grid** has 100 tiny squares. Each square = 0.01.

Try this: Shade 0.35 in one color and 0.42 in another color on the same grid.

- How many squares are shaded in total? \_\_\_\_\_
- What decimal does that represent? \_\_\_\_\_
- Write the equation:  $0.35 + 0.42 =$  \_\_\_\_\_

*This shows that adding decimals is just like counting shaded squares!*

### 🎓 Adding More Than Two Decimals

*You can add three or more decimals the same way. Just line up all the decimal points!*

**Example:**  $2.4 + 1.35 + 0.08$

$$\begin{array}{r} 2.40 \\ 1.35 \\ +0.08 \\ \hline 3.83 \end{array}$$

*Annex zeros so all numbers have two decimal places. Then add column by column!*



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### Oops! Find the Mistake!

Decimal Point Mix-Up! **Problem:** Add  $3.9 + 0.14$ .

A student writes:

$$\begin{array}{r} 3.9 \\ +0.14 \\ \hline 4.04 \end{array}$$

**What went wrong?** The student didn't annex a zero to 3.9. The digits aren't lined up by place value!

**Correct way:** Write 3.9 as 3.90, then add:  $3.90 + 0.14 = 4.04$  ✓

### Math in Real Life!

Adding decimals shows up everywhere!

- **Shopping:** Adding up prices at a store ( $\$4.99 + \$2.50$ ).
- **Cooking:** Combining ingredients ( $1.5$  cups flour  $+ 0.75$  cups sugar).
- **Sports:** Adding up scores in gymnastics ( $8.75 + 9.10$ ).
- **Science:** Combining measurements in a lab experiment.

### Remember!

**Quick check:** After you add, estimate to see if your answer makes sense!

$5.6 + 3.87 \approx 6 + 4 = 10$ . Our exact answer was 9.47 — that's close to 10, so it checks out!



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 **Add Decimals Practice** **Add These Decimals**

1.  $3.42 + 5.36 =$  \_\_\_\_\_

4.  $6.80 + 1.19 =$  \_\_\_\_\_

2.  $7.15 + 2.64 =$  \_\_\_\_\_

5.  $4.09 + 3.81 =$  \_\_\_\_\_

3.  $0.53 + 0.24 =$  \_\_\_\_\_

6.  $8.25 + 0.75 =$  \_\_\_\_\_

**Line Up and Add (Different Decimal Places)**

7.  $6.3 + 2.48 =$  \_\_\_\_\_

10.  $4 + 2.89 =$  \_\_\_\_\_

8.  $0.9 + 0.56 =$  \_\_\_\_\_

11.  $9.1 + 0.07 =$  \_\_\_\_\_

9.  $12.5 + 3.75 =$  \_\_\_\_\_

12.  $15 + 4.32 =$  \_\_\_\_\_

**Show Your Work**

Add using the standard algorithm. Show your regrouping!

13.  $7.68 + 5.47 =$  \_\_\_\_\_

14.  $24.85 + 9.76 =$  \_\_\_\_\_



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15.  $3.94 + 8.08 + 1.53 =$  \_\_\_\_\_

*True or False?*

16.  $5.3 + 2.7 = 7.10$

True  False

17. When adding  $3.6 + 1.45$ , you should write 3.6 as 3.60 first.

True  False

18.  $0.08 + 0.02 = 0.1$

True  False

19.  $12 + 3.5 = 15.5$

True  False

*Word Problems*

20. Jake ran 2.4 km on Monday and 3.75 km on Tuesday. How far did he run in total?

**Answer:** \_\_\_\_\_ km

21. A recipe needs 1.25 cups of milk and 0.5 cups of cream. How much liquid is that in all?

**Answer:** \_\_\_\_\_ cups

22. Three packages weigh 4.6 kg, 2.35 kg, and 1.8 kg. What is the total weight?

**Answer:** \_\_\_\_\_ kg



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 **Challenge!** 

1. The sum of two decimals is 10.00. One of them is 6.35. What is the other? \_\_\_\_\_
2. Find three decimals that each have one decimal place and add up to 5.0.  
\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = 5.0
3. Sarah bought items for \$3.49, \$7.99, and \$0.52. She has \$15.00. How much money does she have left? \_\_\_\_\_

 *You're adding decimals like a champ!*

*Keep that decimal point lined up!* 



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THANK YOU

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