

## Place Value and the Base-Ten System

Each digit in a number has a different value, depending on where it sits. The further left, the bigger the value gets — ten times bigger every single step!

Ten-Thousands	Thousands	Hundreds	Tens	Ones
10,000	1,000	100	10	1

34,256

3	4	2	5	6
Ten-Th.	Th.	H.	T.	O.

### Key Concepts

1. Every digit you see in a number has a *value*, and that value depends on where the digit is sitting. The same digit in different spots is worth different amounts.
2. Each time you move one place to the *left*, the value gets 10 times bigger. The ones become tens, the tens become hundreds, and so on.
3. Each time you move one place to the *right*, the value gets 10 times smaller. That is the whole secret of the base-ten system.
4. *Expanded form* means writing the number as the sum of what each digit is really worth, like this:  $3,245 = 3,000 + 200 + 40 + 5$ .

### Worked Examples

① What is the value of the digit 5 in 6,542?

 Look at where the 5 is sitting in 6,542. Counting from the right, the digits are: 2 (ones), 4 (tens), 5 (hundreds), 6 (thousands). The 5 is in the *hundreds* place, so it stands for 5 groups of 100. Just multiply:  $5 \times 100 = 500$ . That is the digit's true value.

 **Answer:** 500

② Write  $4,000 + 300 + 20 + 8$  in standard form.

 This one is just expanded form going backward! Each piece already tells you what digit belongs in each place: 4,000 means 4 in the thousands, 300 means 3 in the hundreds, 20 means 2 in the tens, and 8 in the ones. Line them up in order from biggest to smallest — thousands, hundreds, tens, ones — and you get the number.

 **Answer:** 4,328

③ In 2,773, which digit is in the tens place?

 The tens place is always the second digit from the right — the spot just to the left of the ones. Reading 2,773 from the right: 3 sits in the ones, and the next digit, 7, is in the tens. So the answer is the 7 on the far right of the pair. Its value is  $7 \times 10 = 70$ .

 **Answer:** 7

 **Practice Problems**

Find the value of the underlined digit or write in expanded/standard form.

- |                                      |  |
|--------------------------------------|--|
| 1. Value of <u>6</u> in 3,652? _____ | 7. Digit in the thousands place of 4,816 _____ |
| 2. Value of <u>8</u> in 8,104? _____ | 8. Digit in the ones place of 3,927 _____      |
| 3. $5,000 + 700 + 30 + 9 =$ _____    | 9. Value of 3 in 1,302 _____                   |
| 4. $2,000 + 400 + 60 + 1 =$ _____    | 10. $6,000 + 50 + 2 =$ _____                   |
| 5. Expanded form of 7,215 _____      | 11. Value of 4 in 34,519 _____                 |
| 6. Expanded form of 9,083 _____      | 12. Expanded form of 15,240 _____              |

**Study Tips**

-  When you are stuck, draw a quick place-value chart and drop each digit into its column. Seeing the columns line up usually makes the value obvious.
-  The order you should know by heart: *ones, tens, hundreds, thousands, ten-thousands*. Each one to the left is ten times bigger than the last.
-  Always double-check expanded form by adding the parts back together. If your sum doesn't match the original number, one of your place values is off.

 **Word Problems**

1. A school has 2,468 books in its library. What is the value of the digit 4 in that number?

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

2. Write the number that has 5 thousands, 0 hundreds, 3 tens, and 7 ones. Then write it in expanded form.

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

**Answer Key — with Friendly Explanations****Practice Problems**

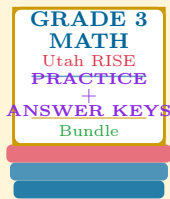
1. Underline the 6 in 3,652. It sits in the hundreds place, so the 6 is worth  $6 \times 100$ .  
💡 **Answer:** 600
2. The 8 in 8,104 is way out on the left — the thousands place — so it stands for  $8 \times 1,000$ .  
💡 **Answer:** 8,000
3. Each piece already tells you the digit: thousands 5, hundreds 7, tens 3, ones 9. Line them up and read.  
💡 **Answer:** 5,739
4. Same idea: thousands 2, hundreds 4, tens 6, ones 1.  
💡 **Answer:** 2,461
5. Break 7,215 into its digits and multiply each by its place:  $7 \times 1000$ ,  $2 \times 100$ ,  $1 \times 10$ ,  $5 \times 1$ . Drop the zero parts and add the rest.  
💡 **Answer:**  $7,000 + 200 + 10 + 5$
6. Same trick: 9 thousands, 0 hundreds, 8 tens, 3 ones. Skip the zero piece since it adds nothing.  
💡 **Answer:**  $9,000 + 80 + 3$
7. Count from the right of 4,816: ones 6, tens 1, hundreds 8, thousands 4. The digit in the thousands place is 4.  
💡 **Answer:** 4
8. The ones place is the very last digit on the right. Look at 3,927: the rightmost digit is 7.  
💡 **Answer:** 7
9. The 3 in 1,302 sits in the hundreds place. Its value is  $3 \times 100$ .  
💡 **Answer:** 300
10. Each piece tells you a digit. There is no hundreds piece given, so put 0 there: thousands 6, hundreds 0, tens 5, ones 2.  
💡 **Answer:** 6,052
11. 34,519 has five digits. Counting from the right: 9, 1, 5, 4, 3. So 4 is the fourth digit from the right — the thousands place. Its value is  $4 \times 1,000$ .  
💡 **Answer:** 4,000
12. 15,240 has five digits. The ones digit is 0, so that piece disappears. Multiply each non-zero digit by its place:  $1 \times 10,000$ ,  $5 \times 1,000$ ,  $2 \times 100$ ,  $4 \times 10$ .  
💡 **Answer:**  $10,000 + 5,000 + 200 + 40$

**Word Problems**

1. The 4 in 2,468 sits in the hundreds place (third from the right). So its value is  $4 \times 100$ .  
💡 **Answer:** 400
2. Fill each place with the digit named. Thousands 5, hundreds 0, tens 3, ones 7 gives 5,037. For expanded form, add up the non-zero pieces:  $5,000 + 30 + 7$ .  
💡 **Answer:** 5,037;  $5,000 + 30 + 7$

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