LESSON MAKER PRO

Place Value Builders

Build, break apart, and write numbers through 100,000.

GRADE 3 · TEKS 3.2.A

3.2.A "compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate;"

NAME _____ DATE _____

BUILD NUMBERS BY PLACE

Each digit tells how many groups are in its place. To decompose a number, write the value of each digit from ten-thousands to ones. A zero means there are no groups in that place. A place-value counter stands for the value assigned to its labeled column. Counter size does not show value. Ten counters in any column can be exchanged for one counter in the next column to the left.

WORKED EXAMPLE

Decompose 64,302 into ten-thousands, thousands, hundreds, tens, and ones. Then write it in expanded notation.

PLACE-VALUE COUNTER PICTURE: EACH CIRCLE HAS THE VALUE OF ITS ROW

Value of one circle	Counter picture	Row total
10,000	○ ○ ○ ○ ○ ○	60,000
1,000	○ ○ ○ ○	4,000
100	○ ○ ○	300
10	no counters	0
1	○ ○	2

1. The 6 means 6 ten-thousands, or 60,000.
2. The 4 means 4 thousands, or 4,000.
3. The 3 means 3 hundreds, the 0 means 0 tens, and the 2 means 2 ones.
4. Add the nonzero values: 60,000 + 4,000 + 300 + 2.

Answer: 6 ten-thousands + 4 thousands + 3 hundreds + 0 tens + 2 ones; 60,000 + 4,000 + 300 + 2

PRACTICE 6 problems

1 Write 47,581 in expanded notation.

ANSWER _____

2 Write the number with 3 ten-thousands, 8 thousands, 6 hundreds, 4 tens, and 9 ones.

ANSWER _____

3 Decompose 90,070 as a sum of ten-thousands, thousands, hundreds, tens, and ones.

ANSWER _____

4 A number has 5 ten-thousands, 2 thousands, 0 hundreds, 1 ten, and 6 ones. Write the number and its expanded notation.

ANSWER _____

_____

5 Decompose 71,405 in expanded notation.

ANSWER _____

6 Write 100,000 as a sum of ten-thousands, thousands, hundreds, tens, and ones.

ANSWER _____

APPLY IT Show your work

1 A game club earned 28,406 points during a school contest. Write the total as a sum of ten-thousands, thousands, hundreds, tens, and ones.

WORK SPACE

ANSWER _____

2 A science museum counted 63,250 visitors during a summer program. Write the number in expanded notation.

WORK SPACE

ANSWER _____

3 Your teacher supplies 30 counters and a mat with columns labeled 10,000; 1,000; 100; 10; 1. Build 21,304 with counters in those columns. Draw a labeled counter picture and write its expanded notation. Then exchange one 1,000-counter for ten 100-counters. Show and draw the new grouping and explain why the total stays the same.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Kai wrote 4 ten-thousands + 13 thousands + 2 tens + 7 ones. What number did Kai make? Explain how you can regroup the thousands.

WORK SPACE AND ANSWER

ANSWER KEY

Place Value Builders

GRADE 3 · TEKS 3.2.A

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write 47,581 in expanded notation.	**40,000 + 7,000 + 500 + 80 + 1**
2	Write the number with 3 ten-thousands, 8 thousands, 6 hundreds, 4 tens, and 9 ones.	**38,649**
3	Decompose 90,070 as a sum of ten-thousands, thousands, hundreds, tens, and ones.	**9 ten-thousands + 0 thousands + 0 hundreds + 7 tens + 0 ones**
4	A number has 5 ten-thousands, 2 thousands, 0 hundreds, 1 ten, and 6 ones. Write the number and its expanded notation.	**52,016; 50,000 + 2,000 + 10 + 6**
5	Decompose 71,405 in expanded notation.	**70,000 + 1,000 + 400 + 5**
6	Write 100,000 as a sum of ten-thousands, thousands, hundreds, tens, and ones.	**10 ten-thousands + 0 thousands + 0 hundreds + 0 tens + 0 ones**

PART 2 · APPLY IT

1. **2 ten-thousands + 8 thousands + 4 hundreds + 0 tens + 6 ones** Read each digit by its place. The 0 shows there are no tens.
2. **60,000 + 3,000 + 200 + 50** Write the value of each nonzero digit. The 0 ones do not need to be written in expanded notation.
3. **2 ten-thousands, 1 thousand, 3 hundreds, 0 tens, 4 ones; 20,000 + 1,000 + 300 + 4 = 21,304. After exchange: 2 ten-thousands, 0 thousands, 13 hundreds, 0 tens, 4 ones; 20,000 + 1,300 + 4 = 21,304.** Provide the mat and real counters. Check the original 2/1/3/0/4 placements and corresponding labeled drawing. Remove one thousand-counter and add ten hundred-counters, giving 2/0/13/0/4. The counter value is determined by its labeled column. Check both actual models and drawings plus the equal expanded sums; isolated numerals without a quantity model are incomplete.

CHALLENGE

53,027. Regroup 13 thousands as 1 ten-thousand and 3 thousands, so there are 5 ten-thousands and 3 thousands.

Accept expanded notation that includes zero-value terms, such as + 0 tens, as equivalent. For the challenge, accept any clear explanation that 13 thousands can be regrouped as 1 ten-thousand and 3 thousands. Apply 3 requires real labeled place-value counter models and matching counter drawings before and after the exchange. The worked table is an explained pictorial counter model, not a claim that equal-size counters have equal numerical value.