

✓ Test Submitted & Graded

Score: 53 / 60 parts correct (88%)

Total Time Taken: **1h 04m 28s**

All answers have been evaluated. See correct answers and step-by-step solutions below.

4th Grade Math Diagnostic — Units 1–3

Suggested time: 60 minutes. Answer every question on your own. No calculator, Khan Academy, hints, or answer checking. Show your work for addition, subtraction, and multiplication.

Unit 1 — Place Value

1. Place-value representations

a. Use the place value chart to write **406,208**.

Hundred thousands	Ten thousands	Thousands	Hundreds
4	0	6	2

b. What is the value of the digit 6 in 406,208?

thousands

c. A place-value model has 3 thousand blocks, 5 hundred flats, 0 ten rods, and 7 ones. What number does the model show?

3507

✓ Solution & Answer Key

a. Hundred thousands: **4**, Ten thousands: **0**, Thousands: **6**, Hundreds: **2**, Tens: **0**, Ones: **8**

b. **6,000** (6 thousands)

c. **3,507** ($3,000 + 500 + 0 + 7$)

2. Number forms

The number is **508,042**.

a. Write 508,042 in expanded form.

$500000+00000+8000+000+40+2$

b. Write 508,042 in word form.

five hundred thousand eight thousand
forty two

✓ Solution & Answer Key

a. Expanded form: $500,000 + 8,000 + 40 + 2$

b. Word form: five hundred eight thousand, forty-two

3. Regrouping place values

a. Complete the equation so both sides have the same value.

$64,320 = 6 \text{ ten thousands} + 4 \text{ thousands} + 3 \text{ hundreds} + 2 \text{ tens}$

$64,320 = 5 \text{ ten thousands} +$

14

thousands + 3 hundreds + 2 tens

b. Regroup the number to express the value in a different way.

7 thousands = 70 hundreds

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a. 14 (Regroup 1 ten thousand into 10 thousands: $4 + 10 = 14$ thousands)

b. 70 (1 thousand = 10 hundreds, so 7 thousands = 70 hundreds)

4. Multiply and divide by 10

a. $470 \times 10 =$ 4700

b. $470 \div 10 =$ 47

c. $81 \text{ ones} \times 10 =$ 810

tens

d. $66 \text{ hundreds} \div 10 =$

660 tens

✓ Solution & Answer Key

a. 4,700

b. 47

c. 81 (81 ones $\times 10 = 810 = 81$ tens)

d. 66 (66 hundreds $= 6,600$; $6,600 \div 10 = 660 = 66$ tens)

5. Compare multi-digit numbers

Complete each comparison by writing $<$, $>$, or $=$.

a. $407,090$ $<$ $407,900$

b. $8,870$ $>$

eight thousand, seven hundred eighty

✓ Solution & Answer Key

a. $<$ ($407,090 < 407,900$ because 0 hundreds $<$ 9 hundreds)

b. $>$ ($8,870 > 8,780$ because 8 hundreds $>$ 7 hundreds)

6. Greatest and smallest numbers

Use each digit exactly once: **0, 2, 4, 4, 7, 9**

a. Write the greatest possible six-digit number.

974420

b. Write the smallest possible six-digit number.

204479

✓ Solution & Answer Key

a. Greatest: 974,420 (ordered largest to smallest)

b. Smallest: 204,479 (first digit nonzero: 2, then 0, then ascending order)

Unit 2 — Addition, Subtraction, and Estimation

7. Round to the nearest hundred

Round **64,372** to the nearest hundred.

64400

✓ Solution & Answer Key

64,400 (Look at the tens digit 7: since $7 \geq 5$, round hundreds digit 3 up to 4).

8. Round to different place values

Round **746,154** to each place value.

a. Nearest 100,000

700000

b. Nearest 10,000

750000

c. Nearest 1,000

746000

✓ Solution & Answer Key

a. Nearest 100,000: 700,000 (ten-thousands digit 4 rounds down)

b. Nearest 10,000: 750,000 (thousands digit 6 rounds up)

c. Nearest 1,000: 746,000 (hundreds digit 1 rounds down)

9. Rounding word problem

A museum had **28,642** visitors last month. Round the number of visitors to the nearest thousand.

29000

✓ Solution & Answer Key

29,000 visitors (Look at the hundreds digit 6: since $6 \geq 5$, round 8 up to 9).

10. Rounding reasoning

a. Which digit makes the statement true?

53,□72 rounds to 53,500 when rounded to the nearest hundred.

4

b. A whole number rounds to **28,000** when rounded to the nearest thousand.

Least possible whole number

28500

Greatest possible whole number

28999

✓ Solution & Answer Key

a. 4 (Because tens digit 7 rounds the hundreds digit up by 1: 4 rounds up to 5, giving 53,500)

b. Least possible: 27,500

Greatest possible: 28,499

11. Addition

a. $468 + 257 =$ 725

b. Add. Show your work.

$$\begin{array}{r} 408,736 \\ + 57,894 \\ \hline \end{array}$$

466630

✓ Solution & Answer Key

a. **725** ($8+7=15$, $6+5+1=12$, $4+2+1=7$)

b. **466,630**

$$\begin{array}{r} 408,736 \\ + 57,894 \\ \hline 466,630 \end{array}$$

12. Subtraction

a. $704 - 286 =$ 418

b. Subtract. Show your work.

$$\begin{array}{r} 500,024 \\ - 268,759 \\ \hline \end{array}$$

231165

✓ Solution & Answer Key

a. 418 (Regroup 700 to 690+14: $14-6=8$, $9-8=1$, $6-2=4$)

b. 231,265

$$\begin{array}{r} 500,024 \\ - 268,759 \\ \hline 231,265 \end{array}$$

Unit 3 — Multiply by 1-Digit Numbers

13. "Times as many"

a. 24 is

times as many as 6.

b. Maya collected 42 shells. She collected 7 times as many shells as Eli. Let E represent the number of shells Eli collected.

Write a multiplication equation.

$$7 \times 6 = 42$$

How many shells did Eli collect?

6

✓ Solution & Answer Key

a. 4 ($24 = 4 \times 6$)

b. Equation: $7 \times E = 42$ (or $E \times 7 = 42$)

Eli collected: 6 shells ($42 \div 7 = 6$)

14. Multiply by 10, 100, 1,000, and their multiples

a. Multiply.

$6 \times 10 = 60$

$6 \times 100 = 600$

$6 \times 1,000 = 6000$

b. Multiply.

$7 \times 80 = 560$

$7 \times 800 = 5600$

$7 \times 8,000 = 56000$

c. Fill in the blanks.

$4 \times 3,000 = 4 \times 3 \times 1,000$

$= 12 \times 1,000$

$= 12000$

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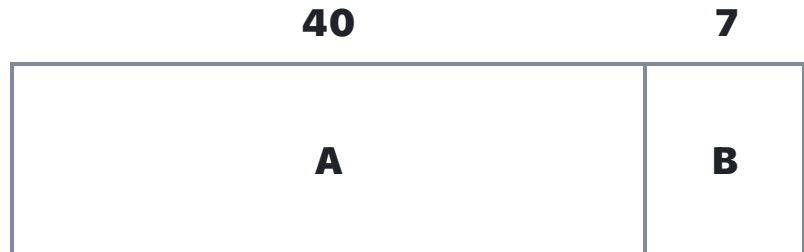
a. 60, 600, 6,000

b. 560, 5,600, 56,000

c. $12 \times 1,000 = 12,000$

15. Area model and break-apart rule: 2-digit $\times$ 1-digit

The area model represents 6×47 .



a. Find each partial area.

240

42

b. Find the total product.

282

c. Complete the break-apart equation.

$$6 \times 47 = 6 \times (40 + 7)$$

$$= (6 \times 40) + (6 \times$$

$$7)$$

✓ **Solution & Answer Key**

a. Partial areas: A = 240 (6×40), B = 42

$$(6 \times 7)$$

b. Total product: 282 ($240 + 42 = 282$)

c. $(6 \times 40) + (6 \times 7)$

16. Area model and break-apart rule: 4-digit $\times$ 1-digit

The area model represents $4 \times 1,326$.

1,000	300	20	6
A	B	C	D

a. Find each partial area.

4000

1200

80

24

b. Write the sum of the partial products.

$$4000+1200+80+24=5,304$$

c. Find the total product.

5,304

✓ Solution & Answer Key

a. Partial areas: A = **4,000** ($4 \times 1,000$), B = **1,200** (4×300), C = **80** (4×20), D = **24** (4×6)

b. Sum: **$4,000 + 1,200 + 80 + 24$**

c. Total product: **5,304**

17. Estimate a product

Estimate $5 \times 6,482$.

a. Round 6,482 to the nearest thousand.

6000

b. Use the rounded number to estimate the product.

30000

✓ Solution & Answer Key

a. **6,000** (hundreds digit 4 rounds down to 6,000)

b. **Estimated product: 30,000** ($5 \times 6,000 = 30,000$)

18. Multiplication procedures

a. Multiply without regrouping.

$$3 \times 2,103 = 6306$$

b. Complete the partial-products work for $2,104 \times 8$.

$$8 \times 4 = 32$$