New

Pioneers Graded Maths 5

Second Edition

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Contents

01 Numbers

Lesson 1 Place Value Through Hundred Thousands

You can write numbers in different ways.

417,805 can be written in the following ways:

standard form	417,805
word form	four hundred seventeen thousand, eight hundred and five
short word form	417 thousand, 805
expanded form	400,000 + 10,000 + 7,000 + 800 + 5

Write each number in standard form.

735 thousand, 25 .....

800,000 + 4,000 + 60 + 2 .....

100,000 + 900 + 20 + 3 .....

three hundred forty-seven thousand, two hundred and three

.....

Write the value of the following numbers in word form.

137,294 .....

563,089 .....

426,718 .....

Write the following number in word form, short word form and in expanded form.

702,946 .....

.....

.....

.....

Lesson 2

More About Place Value

If we have a number of identical factors, we can rewrite it using exponents. The identical factor is called a base.
An exponent is simply shorthand for multiplying a number of bases. 4^3 is the same as $4 \times 4 \times 4$. The three is the exponent indicating the number of bases.
To write in expanded form, use 10 as a base number multiplied by the number representing the place value.

Example 1: $125 = 5 \times 5 \times 5$

$125 = 5^3$

Example 2: $100 = 10 \times 10 = 10^2$

$1{,}000 = 10 \times 10 \times 10 = 10^3$

$10{,}000 = 10 \times 10 \times 10 \times 10 = 10^4$

Example 3: Write the number 32,528 using exponents.

First, we decompose the number (we write it in expanded form).

$32{,}528 = (3 \times 10{,}000) + (2 \times 1{,}000) + (5 \times 100) + (2 \times 10) + 8$

Next, we write the number with each place value multiplied by the number of tens to represent that place value.

$= 3 \times (10 \times 10 \times 10 \times 10) + 2 \times (10 \times 10 \times 10) + 5 \times (10 \times 10) + 2 \times 10 + 8$

Finally, we write the number as each place value multiplied by 10 with each 10 written as an exponent.

$= 3 \times 10^4 + 2 \times 10^3 + 5 \times 10^2 + 2 \times 10 + 8$

Write 653,496 in expanded form using exponents.

02 Addition and Subtraction

Lesson 1 Estimating Sums and Differences

Three Ways to Estimate a Sum or Difference:

Round to the greatest place value.	Round to the greatest place using the first two digits.	Use front-end estimation.
3,278 → 3,000 + 1,634 → +2,000 5,000	3,278 → 3,300 + 1,634 → + 1,600 4,900	3,278 → 3,000 +1,634 → + 2,000 5,000

In front-end estimation, we add or subtract the digit of the highest place value (the front-end digit), then insert zeros for the other place values. It is the same as rounding to the greatest place value.

Estimate. Write which method you used.

957
+ 512

.....

6,114
+2,352

.....

7,020
+1,986

.....

57,308 − 29,554 = ...

Estimate and write your answer. Decide whether the sum is closer to 50 or100 by circling 50 or 100.

33 + 24 = ... 50 / 100

54 + 46 = ... 50 / 100

67 + 27 = ... 50 / 100

41 + 13 = ... 50 / 100

Lesson 2

Adding and Subtracting Whole Numbers

When adding or subtracting whole numbers, regroup when necessary.

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ 1\ \ 1} \\ 66,834 \\ +\ 23,166 \\ \hline 90,000 \end{array} \qquad \begin{array}{r} {\scriptstyle 7\ \ 9\ \ 9\ \ 10} \\ 18,000 \\ -\ 12,843 \\ \hline 05,157 \end{array}$$

Find each sum or difference.

$$\begin{array}{r} 8,914 \\ +\ 6,382 \\ \hline \end{array} \qquad \begin{array}{r} 41,948 \\ +\ 8,655 \\ \hline \end{array}$$

$$\begin{array}{r} 4,000 \\ -\ 2,731 \\ \hline \end{array} \qquad \begin{array}{r} 10,000 \\ -\ 3,629 \\ \hline \end{array}$$

Find each sum or difference given n = 2,000,000 and s = 350.

$n + 7{,}000{,}000 =$ $\qquad$ $n + 7 =$ $\qquad$ $n + 7{,}000 =$

$1{,}000 - s =$ $\qquad$ $10{,}000 - s =$

Lesson 3

Adding and Subtracting Greater Numbers

Look at the addition or subtraction problems. Notice how the ones digits are lined up.

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ 1\ \ \ \ 1} \\ 4,871,506 \\ +\ 1,349,005 \\ \hline 6,220,511 \end{array}$$

$$\begin{array}{r} {\scriptstyle 1\ 9\ 9\ 9\ 9\ 10} \\ \cancel{200,000} \\ -\ \ 65,815 \\ \hline 134,185 \end{array}$$

We can also estimate before adding or subtracting by rounding to the greatest place value.

$$\begin{array}{r} 4,871,506 \\ +\ 1,349,005 \\ \hline \end{array} \xrightarrow[\text{round to}]{\text{round to}} \text{Estimate} \quad \begin{array}{r} 5,000,000 \\ +\ 1,000,000 \\ \hline 6,000,000 \end{array}$$

$$\begin{array}{r} 200,000 \\ -\ \ 65,815 \\ \hline \end{array} \xrightarrow[\text{round to}]{\text{round to}} \text{Estimate} \quad \begin{array}{r} 200,000 \\ -\ \ 70,000 \\ \hline 130,000 \end{array}$$

Find each sum or difference.

$$\begin{array}{r} 708,214 \\ +\ 290,528 \\ \hline \end{array} \qquad \begin{array}{r} 6,927,000 \\ -\ 2,000,000 \\ \hline \end{array} \qquad \begin{array}{r} 346,572 \\ +\ 628,719 \\ \hline \end{array}$$

5,700,000 − 65,500=

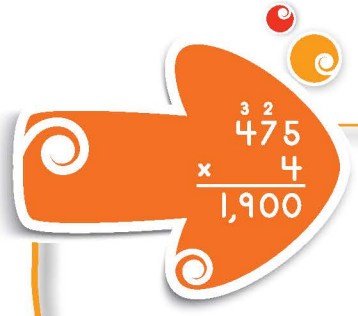
360,000 + 640,000=

Find each sum or difference by estimating.

$$\begin{array}{r} 3,254,107 \\ -\ 2,731,456 \\ \hline \end{array} \qquad \begin{array}{r} 452,367,189 \\ -\ \ 89,521,043 \\ \hline \end{array}$$

03 Multiplication

Lesson 1 Multiplying by One-digit Numbers



$$\begin{aligned} 4 \times 475 &= 4 \times (400 + 70 + 5) \\ &= (4 \times 400) + (4 \times 70) + (4 \times 5) \\ &= 1{,}600 + 280 + 20 \\ &= 1{,}900 \end{aligned}$$

Find each product.

58 × 6	561 × 9	7,462 × 8
285,115 × 3=		2 × 474,691=
5 × 856,423=		7 × 345,862=

Use the distributive property to rewrite each expression, then solve to find the product.

Remember, the distributive property allows you to find the sum of the products by multiplying each addend of the second number separately, and then adding the products. Example:

4 × 2,345 = (4 × 2000) + (4 × 300) + (4 × 40) + (4 × 5).

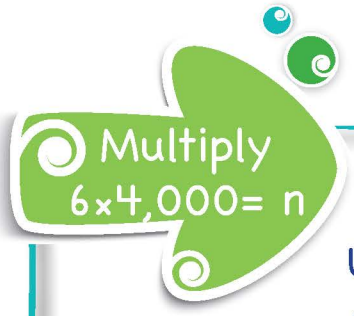
7 × 2,393 = ...

52,816 × 4 = ...

8 × 625,453 = ...

Lesson 2

Patterns in Multiples of 10



Different Ways to Multiply by Multiples of 10:

Use a pattern.

6 × 4 = 24
6 × 40 = 240
6 × 400 = 2,400
6 × 4,000 = 24,000

Use mental maths.

6 × 4,000 = 6 × 4 × 1,000
= 24 × 1,000
= 24,000

Use a pattern or mental maths to find each product.

70 × 8	600 × 9	9,000 × 5
500 × 70	900 × 9	6,000 × 80

Find each product.

37 × 60=	728 × 30=	641 × 70=
398 × 20=	566 × 50=	435 × 60=

Estimating Products

Different Ways to Estimate Products

front-end estimation		rounding		finding a range		
84	80	84	80	84	80	90
× 37	× 40	× 37	× 40	× 37	× 30	× 40
	3,200		3,200		2,400	3,600

Estimate each product by using front-end estimation or rounding.

26 × 49=

18 × 79=

32 × 21=

85 × 442=

Estimate each product finding a range, then find the actual product.

23 × 79=

71 × 19=

Multiplying by Two-digit Numbers

Different Ways to Multiply by Two-digit Numbers:

```
   1
  1 2
  147
×  24
  588
+2940
3,528
```

$147 \times 24 = 147 \times (20 + 4)$
$= (147 \times 20) + (147 \times 4)$
$= 2,940 + 588$
$= 3,528$

Find each product. Estimate or use a calculator to check.

65×29

591×54

198×22

86×51

94×17

Use the distributive property to rewrite each expression, then solve.

Notice that a product can be written as the sum of or difference between two products. Example:

$16 \times 49 \longrightarrow (16 \times 50) - (16 \times 1) \longrightarrow 800 - 16 = 784$

$61 \times 19 =$

$725 \times 48 =$

04 Division

Lesson 1 Estimating Quotients

Estimate
1,759 ÷ 6 = n

Estimating With Compatible Numbers:

Note: when a dividend can be easily divided by a divisor, the dividend and the divisor are compatible. For example, 18 and 6 are compatible.

Round a dividend to a multiple of 10 that can be divided easily by 6.

1,800 ÷ 6 = n

$$6\overline{)1{,}800}\quad 300$$

The estimated quotient is 300.

Estimate each quotient.

649 ÷ 8 =

2,479 ÷ 5 =

43,054 ÷ 6 =

$5\overline{)408}$

$6\overline{)2{,}371}$

$8\overline{)3{,}297}$

$3\overline{)11{,}955}$

One-digit Divisors

Quotients With Remainders:

If a dividend and divisor are not compatible numbers, then the quotient will include a remainder.

Divide 315 ÷ 6.

$$\begin{array}{r} 52\ R3 \\ 6\overline{)315} \\ -\ 30 \\ \hline 15 \\ -12 \\ \hline 3 \end{array}$$

Check:

$(52 \times 6) + 3$

$312 + 3 = 315$

Find each quotient and check.

$4\overline{)138}$

3,191 ÷ 6=

$9\overline{)71,824}$

$3\overline{)12,662}$

$2\overline{)9,257}$

Write and solve a division statement for each equation.

The division statement 17 ÷ 4 = 4 R1 can be rewritten as $(4 \times 4) + 1 = 17$.

$4a + r = 27$

$2b + r = 21$

Lesson 3 Divisibility

Divisbility Rules:

A number is divisible by another number when the quotient is a whole number and there is no remainder. Any factor of a given number divides into that number with no remainder.

For each number, write whether it is divisible by 2, 3, 4, 5, 6, 9 or 10.

712	810	388	621	524
.....	.....	.....	.....	.....
460	1,912	5,700	3,126	1,890
.....	.....	.....	.....	.....

Use the table to solve.

1. Majed and other members of his class collected a total number of cans that is divisible by 4. In what grade is Majed?

.....

2. The cans from each grade are packed individually in boxes of 9. Which two grades' cans will have boxes that are partially full?

.....

Canned Food Drive Totals	
Grade	Cans Collected
3	668
4	670
5	702
6	585