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ABSTRACT

This teacher guide is part of the materials prepared for an individualized program for ninth-grade algebra and basic mathematics students. Materials written for the program are to be used with audiovisual lessons recorded on tape cassettes. For an evaluation of the program, see ED 086 545. In this guide, the teacher is provided with objectives for each topic area and guided to materials written for a given topic. Three short criterion tests are included for each topic covered. The work in this package provides practice with multiplication and division with whole numbers. The commutative and associative properties for multiplication are reviewed and problems involving the distributive law are presented. Work is provided on multiplication by 10, 100 and 1000 and on estimating the answer to division problems. This work was prepared under an ESEA Title III contract. (JP)

BASIC MATH I

Package # 01-03

MULTIPLICATION AND DIVISION OF WHOLE NUMBERS

Prepared By

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MULTIPLICATION AND DIVISION OF WHOLE NUMBERS

Multiplication and division are as necessary to modern living as addition and subtraction. In fact, multiplication is a special form of addition and division is a special form of subtraction. Suppose you work forty hours a week at $2.75 per hour. You could find your weekly wage by adding $2.75 forty times like $2.75 + $2.75 + $2.75 + $2.75 etc. Or you could find your weekly wage by multiplying $2.75 by 40 like $2.75 x 40.

It is clear that you can get along better in every day life if you can multiply and divide with accuracy and also if you know when multiplication or division can help you.

PACKAGE GOAL: to gain understandings which will lead to greater accuracy in multiplication and division of whole numbers, and to improve ability to work verbal problems leading to multiplication and division of whole numbers.

PACKAGE OBJECTIVES:

1. Given any two (they may be equal) of the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, write their product.

2. Given a sentence like 4X___ = 9X___ or 6 X (4 X 3) = (6 X 4)X___, use the commutative or associative law of multiplication to complete it.

3. Given two numbers in which 10, 100, or 1000 or a multiple of 10, 100, 1000 occurs as a factor, write the product.

4. Given an applied problem, use the distributive law to solve it.

5. Given an applied problem in which it is necessary to multiply a larger number by 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9, translate it into a number sentence and solve the resulting sentence.

6. Given an applied problem in which 10, 100, or 1000 or multiples of 10, 100, or 1000 occur, translate it into a number sentence and solve the resulting sentence.

7. Given any two whole numbers, write their product.

8. Given a one or two digit whole number, divide it by a single digit number and write the quotient.

9. Given a division problem, find the quotient by the "guess, multiply, subtract," method.

10. Given an applied problem, translate it into a number sentence and solve the sentence using the division method of estimating multiples of thousands, hundreds, tens, and ones.

11. Given a division problem, show the short form for finding its quotient.

I. U. # 01-03-01

Multiplication and Division of Whole Numbers

You should recall that:

Multiplication and division depend not only on understanding the ideas, but upon being able to recall the basic multiplication combinations. If you have trouble remembering them quickly now, take time to re-learn them so well that you can remember them quickly.

OBJECTIVES:

1. When asked to write the property of 0 for multiplication, write "The product of zero and any number is zero."

2. When asked to write the property of one for multiplication, you will write "The product of one and any whole number is that number."

3. Given any two of the numbers, (they may be equal) 0,1,2,3,4,5,6,7,8,9, write their product.

ACTIVITIES:

Study: page 73, AAMA, and do margin exercises 1 - 6 (objective 1)

page 74, AAMA, and do margin exercises 8 and 9 (objective 2)

Write exercise set 1, page 103 and 104. You should be able to find these products mentally, quickly, and accurately. If you must resort to combining sets, or repeated addition, to find a product try to memorize that combination. This exercise is very important, because your ability to be fast and accurate on the rest of your arithemetic depends upon the speed and accuracy that you develop in recalling these multiplication combinations. Most students who have difficulty with these have trouble with the larger numbers like 7 X 8 or 9 X 6. If necessary make a chart of the multiplication combinations for yourself like the one illustrated on the following page.

	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

Criterion Test 01-03-01-01

1. Write the property of 0 for multiplication.

2. Write the property of 1 for multiplication.

3. Find the product.

(a)	6 x 9	(j)	4 x 7	(s)	8 x 7
(b)	7 x 6	(k)	4 x 3	(t)	5 x 9
(c)	8 x 4	(l)	5 x 8	(u)	6 x 8
(d)	7 x 3	(m)	8 x 9	(v)	9 x 3
(e)	8 x 8	(n)	4 x 6	(w)	9 x 9
(f)	6 x 6	(o)	6 x 7	(x)	3 x 8
(g)	4 x 9	(p)	5 x 7	(y)	6 x 5
(h)	9 x 7	(q)	7 x 8	(z)	7 x 7
(i)	3 x 6	(r)	6 x 3		

Criterion Test 01-03-01-02

1. Write the property of 0 for multiplication.

2. Write the property of 1 for multiplication.

3. Find the product.

(a)	7 x 9	(j)	8 x 7	(s)	7 x 7
(b)	9 x 4	(k)	7 x 5	(t)	5 x 6
(c)	6 x 6	(l)	7 x 6	(u)	8 x 3
(d)	8 x 8	(m)	6 x 4	(v)	9 x 9
(e)	7 x 3	(n)	9 x 8	(w)	9 x 3
(f)	4 x 8	(o)	8 x 5	(x)	6 x 8
(g)	6 x 7	(p)	3 x 4	(y)	9 x 5
(h)	9 x 6	(q)	7 x 4	(z)	7 x 8
(i)	3 x 6	(r)	6 x 3		

Criterion Test 01-03-01-03

1. Write the property of 0 for multiplication.

2. Write the property of 1 for multiplication.

3. Find the product.

(a)	7 x 9	(j)	9 x 9	(s)	8 x 7
(b)	8 x 7	(k)	4 x 8	(t)	4 x 7
(c)	9 x 4	(l)	3 x 8	(u)	7 x 5
(d)	5 x 9	(m)	7 x 6	(v)	4 x 3
(e)	6 x 6	(n)	6 x 5	(w)	6 x 7
(f)	8 x 6	(o)	9 x 6	(x)	5 x 8
(g)	8 x 8	(p)	7 x 7	(y)	6 x 4
(h)	3 x 9	(q)	6 x 3	(z)	9 x 8
(i)	7 x 3	(r)	3 x 6		

Answers to Criterion Tests

Test 01-03-01-01

1. The product of zero and any number is zero.

2. The product of one and any number is that number.

3.

(a) 54	(h) 63	(o) 42	(v) 27
(b) 42	(i) 18	(p) 35	(w) 81
(c) 32	(j) 28	(q) 56	(x) 24
(d) 21	(k) 12	(r) 18	(y) 30
(e) 64	(l) 40	(s) 56	(z) 49
(f) 36	(m) 72	(t) 45	
(g) 36	(n) 24	(u) 48	

Test 01-03-01-02

1. The product of zero and any number is zero.

2. The product of one and any number is that number.

3.

(a) 63	(h) 54	(o) 40	(v) 81
(b) 36	(i) 18	(p) 12	(w) 27
(c) 36	(j) 56	(q) 28	(x) 48
(d) 64	(k) 35	(r) 18	(y) 45
(e) 21	(l) 42	(s) 49	(z) 56
(f) 32	(m) 24	(t) 30	
(g) 42	(n) 72	(u) 24	

Test 01-03-01-03

1. The product of zero and any number is zero.

2. The product of one and any number is that number.

3.

(a) 63	(h) 27	(o) 54	(v) 12
(b) 56	(i) 21	(p) 49	(w) 42
(c) 36	(j) 81	(q) 18	(x) 40
(d) 45	(k) 32	(r) 18	(y) 24
(e) 36	(l) 24	(s) 56	(z) 72
(f) 48	(m) 42	(t) 28	
(g) 64	(n) 30	(u) 35	

I. U. # 01-03-02

The Commutative and Associative Laws Of Multiplication

OBJECTIVES:

1. When asked to state the commutative law of multiplication, you will write "The order in which whole numbers are multiplied does not affect the product".

2. When asked to state the associative law of multiplication, you will write "To multiply three or more numbers, it does not matter how we group them".

3. Given a sentence like $4 \times \_\_\_ = 9 \times \_\_\_$ or $6 \times (4 \times 3) = (6 \times 3) \times \_\_\_$, use the commutative or associative law of multiplication to complete it.

ACTIVITIES:

1. Study page 75, AAMA, and do margin exercises 9 - 10 (Objective 1 - 3)

2. Study page 75, do margin exercises 11 - 14 (Objectives 2 and 3)

3. Write practice set 2, pages 105 - 106 (Objective 3)

Criterion Test 01-03-02-01

1. State the commutative law of multiplication.
2. State the associative law of multiplication
3. Complete:

   (a) 3 x 87 = 87 x __ (b) 30 x (10 x 5) = (30 x __) x 5

   (c) 311 x __ = 189 x __ (d) 8 x (__ x 9) = (8 x 7) x 9

Criterion Test 01-03-02-02

1. State the commutative law of multiplication.
2. State the associative law of multiplication.
3. Complete:

   (a) 15 x __ = 7 x __ (b) 15 x (7 x 3) = (15 x 7) x __

   (c) __ x 23 = 23 x 14 (d) 2 x (3 x __) = (2 x 3) x 4

Criterion Test 01-03-02-03

1. State the commutative law of multiplication.
2. State the associative law of multiplication.
3. Complete:

   (a) 5 x 8 = 8 x __ (b) __ x 14 = __ x 75

   (c) (3 x 5) x 7 = __ x (5 x 7) (d) (5 x 6) x __ = 5 x (6 x 7)

Answers to Criterion Tests

Test 01-03-02-01

1. The order in which whole numbers are multiplied does not affect the product.

2. To multiply three or more numbers it does not matter how we group them.

3. (a) $3 \times 87 = 87 \times \underline{3}$ (b) $30 \times (10 \times 5) = (30 \times \underline{10}) \times 5$

   (c) $311 \times \underline{189} = 189 \times \underline{311}$ (d) $8 \times (\underline{7} \times 9) = (8 \times 7) \times 9$

Test 01-03-02-02

1. The order in which whole numbers are multiplied does not affect the product.

2. To multiply three or more numbers it does not matter how we group them.

3. (a) $15 \times \underline{7} = 7 \times \underline{15}$ (b) $15 \times (7 \times 3) = (15 \times 7) \times \underline{3}$

   (c) $\underline{14} \times 23 = 23 \times 14$ (d) $2 \times (3 \times \underline{4}) = (2 \times 3) \times 4$

Test 01-03-02-03

1. The order in which whole numbers are multiplied does not affect the product.

2. To multiply three or more numbers it does not matter how we group them.

3. (a) $5 \times 8 = 8 \times \underline{5}$ (b) $\underline{75} \times 14 = \underline{14} \times 75$

   (c) $(3 \times 5) \times 7 = \underline{3} \times (5 \times 7)$ (d) $(5 \times 6) \times \underline{7} = 5 \times (6 \times 7)$

I. U. # 01-03-03

Multiplication by Multiples of 10, 100, or 1000

You will need to recall:

The associative and commutative laws of multiplication.

OBJECTIVES:

1. Given a problem requiring multiplying by 10 or a multiple of 10, write the product.

2. Given a problem in multiplying by 100 or a multiple of 100, write the product.

3. Given a problem involving a multiplication by 1000 or a multiple of 1000, write the product.

4. Given a problem in which we are required to multiply 10, 100, or 1000 by a multiple of 10, 100, 1000, write the product.

5. Given an equation like $4 \cdot 5 = n$ or $4 \cdot n = 24$, write its solution.

6. Given a multiplication problem in which 10, 100, or 1000 or multiples of 10, 100, or 1000 occur, write the product.

ACTIVITIES:

1. Study page 76, AAMA, and do margin exercises 15 - 20 (Objective 1)

2. Study pages 76 - 77 and do margin exercises 23 - 30 (Objective 2)

3. Study page 77 and do margin exercises 31 - 39 (Objective 3)

4. Study pages 77 and 78 and do margin exercises 40 - 45. (Objective 4)

5. Study page 78 and do margin exercises 46 - 48 (Objective 5)

6. Write exercises set 3 pages 107 - 108 (Objectives 1, 2, 3, 4, 5, 6)

Criterion Test 01-03-03-01

1. Find the product.

   (a) 78 x 10 (b) 50 x 9

2. Find the product.

   (a) 321 x 100 (b) 7 x 600

3. Find the product.

   (a) 457 x 1000 (b) 6000 x 8

4. Find the product.

   (a) 40 x 30 (b) 300 x 60 (c) 6000 x 4000

5. Solve.

   (a) $6 \circ 4 = n$ (b) $6 \circ n = 18$

   (c) $n \circ 8 = 24$ (d) $(3 \circ 4) + (2 \circ 3) = n$

6. Find the product.

   (a) 50 x 8 (b) 45 x 100 (c) 8 x 8000

   (d) 5000 x 4000

Criterion Test 01-03-03-02

1. Write the product.

   (a) 45 x 10 (b) 8 x 60

2. Write the product.

   (a) 127 x 100 (b) 5 x 700

3. Write the product.

   (a) 322 x 1000 (b) 7 x 7000

4. Write the product.

   (a) 50 x 30 (b) 300 x 40 (c) 7000 x 2000

5. Solve.

   (a) $7 \cdot 8 = n$ (b) $7 \cdot n = 42$ (c) $n \cdot 6 = 42$

6. Find the product.

   (a) 40 x 7 (b) 36 x 100 (c) 7 x 8000

   (d) 4000 x 7000

Criterion Test 01-03-03-03

1. Write the product.

   (a) 65 x 10 (b) 70 x 3

2. Write the product.

   (a) 432 x 100 (b) 5 x 700

3. Write the product.

   (a) 798 x 1000 (b) 6 x 7000

4. Write the product.

   (a) 50 x 70 (b) 400 x 80 (c) 9000 x 9000

5. Solve.

   (a) $7 \cdot 5 = n$ (b) $6n = 36$ (c) $n \cdot 9 = 63$

6. Write the product.

   (a) 40 x 90 (b) 145 x 100 (c) 6 x 9000

   (d) 3000 x 8000

Answers to Criterion Tests

Test 01-03-03-01

1.	(a)	780		(b)	450			
2.	(a)	32,100		(b)	4,200			
3.	(a)	457,000		(b)	48,000			
4.	(a)	1,200		(b)	18,000		(c)	24,000,000
5.	(a)	24	(b)	3	(c)	3	(d)	18
6.	(a)	400	(b)	4,500	(c)	64,000	(d)	20,000,000

Test 01-03-03-02

1.	(a)	450		(b)	480			
2.	(a)	12,700		(b)	3,500			
3.	(a)	322,000		(b)	49,000			
4.	(a)	1,500		(b)	12,000		(c)	14,000,000
5.	(a)	56		(b)	6		(c)	7
6.	(a)	280	(b)	3,600	(c)	56,000	(d)	28,000,000

Test 01-03-03-03

1.	(a)	650		(b)	210			
2.	(a)	43,200		(b)	3,500			
3.	(a)	798,000		(b)	42,000			
4.	(a)	3,500		(b)	32,000		(c)	81,000,000
5.	(a)	35		(b)	6		(c)	7
6.	(a)	3,600	(b)	14,500	(c)	54,000	(d)	24,000,000

I. U. # 01-03-04

The Distributive Law

OBJECTIVES:

1. When asked to state the distributive law of multiplication over addition, you will write "In a problem like $a \cdot (b + c)$, we can add first, then multiply, or we can multiply first, then add."

2. Given a sentence like $60 \times (20 + 50) = (\_\_ \times 20) + (\_\_ \times 50)$, or $4(8 + 11) = (4 \times 8) + (4 \times n)$, use the distributive law to complete it.

3. Given an applied problem, use the distributive law to solve it.

ACTIVITIES:

1. Study pages 79-80 and do margin exercises 49 - 53. (Objectives 1 and 2)

2. Write exercise set 4, pages 109-110. (Objectives 1, 2, and 3)

Criterion Test 01-03-04-01

1. State the distributive law of multiplication over addition.

2. Complete.

   (a) $4(8 + 11) = (4 \times 8) + (4 \times \_\_)$

   Solve.

   (b) $n \times (6 + 17) = (41 \times 6) + (41 \times 17)$

3. Translate into two number sentences and solve them.

   (a) A rectangular field is 200 ft, by 400 ft. Find its perimeter. (the perimeter is the total distance around the field.)

Criterion Test 01-03-04-02

1. State the distributive law of multiplication over addition.

2. Complete.

   (a) $\_\_ \times (6 + 8) = (9 \times 6) + (9 \times 8)$

   Solve.

   (b) $7 \times (9 + 6) = (n \times 9) + (7 \times 6)$

3. Translate into two number sentences and solve them.

   (a) Board and Room at Malfunction Junction Jr. College is $70 per month for meals and $50 per month for a room. How much is room and board for the 9 months of a college term?

Criterion Test 01-03-04-03

1. State the distributive law of multiplication over addition.

2. Complete.

   (a) $7 \times (9 + 8) = (\_\_ \times 9) + (7 \times 8)$

   Solve.

   (b) $7 \times (9 + 54) = (n \times 9) + (7 \times 54)$

3. Translate into two number sentences and solve them.

   (a) Walt Wipe earned $2.00 for each car he washed. He washed 4 cars on Friday and 3 cars on Saturday. How much money did he earn altogether?

Answers to Criterion Tests

Test 01-03-04-01

1. We can add first, then multiply or we can multiply first, then add.

2. (a) $4(8 + 11) = (4 \times 8) + (4 \times \underline{11})$

   (b) $\underline{41} \times (6 + 17) = (41 \times 6) + (41 \times 17)$

3. $(2 \times 200) + (2 \times 400) = n$, $n =$ ~~1200~~ 1200 or
   $2(200 + 400) = n$, $n =$ ~~1200~~ 1200

Test 01-03-04-02

1. We can add first, then multiply or we can multiply first, then add.

2. (a) $\underline{9} \times (6 + 8) = (9 \times 6) + (9 \times 8)$

   (b) $n = 7$

3. $(9 \times 70) + (9 \times 50) = n$, $n = 1080$ or
   $9(70 + 50) = n$, $n = 1080$

Test 01-03-04-03

1. We can add first, then multiply or we can multiply first, then add.

2. (a) $7 \times (9 + 8) = (\underline{7} \times 9) + (7 \times 8)$

   (b) $n = 7$

3. $(2 \times 4) + (2 \times 3) = n$, $n = 14$ or
   $2(4 + 3) = n$, $n = 14$

I. U. # 01-03-05

More Multiplication and Translating into Number Sentences

You will need to recall:

1. The basic multiplication combinations.

OBJECTIVES:

1. Given a larger number and one of the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, write their product.

2. Given an applied problem, translate it into a number sentence.

ACTIVITIES:

1. Study pages 81, 82 and do margin exercises 54 - 61. (Objective 1)

2. Study page 82 and do margin exercises 62, 63 (Objective 2)

3. Write exercise set 5, pages 111, 112 (Objectives 1, 2)

Criterion Test 01-03-05-01

1. Write the product.

   (a) $\begin{array}{r} 5472 \\ \times\ \ 6 \\ \hline \end{array}$ (b) $\begin{array}{r} 7896 \\ \times\ \ 9 \\ \hline \end{array}$

2. Translate into a number sentence. Do not solve.

   (a) Every seat at Big Red's football stadium is sold at every game. There are 65,427 seats. What is the total number of seats sold at the seven home games this year?

Criterion Test 01-03-05-02

1. Write the product.

   (a) $\begin{array}{r} 6789 \\ \times\ \ 8 \\ \hline \end{array}$ (b) $\begin{array}{r} 9876 \\ \times\ \ 7 \\ \hline \end{array}$

2. Translate into a number sentence. Do not solve.

   (a) 232 pints of milk are served at hot lunch each school day. Find the number of pints used in one week.

Criterion Test 01-03-05-03

1. Write the product.

   (a) $\begin{array}{r} 6978 \\ \times\ \ 9 \\ \hline \end{array}$ (b) $\begin{array}{r} 9768 \\ \times\ \ 8 \\ \hline \end{array}$

2. Translate into a number sentence. Do not solve.
   Wheeler Dealer sold 150 cars at $3450 per car and 24 trucks at $5280 per truck. Find the total dollars received on this deal.

Answers to Criterion Tests

Test 01-03-05-01

1. (a) 32832 (b) 71064

2. (a) n = 65,427 x 7

Criterion Test 01-03-05-02

1. (a) 54312 (b) 69132

2. (a) 232 x 5 = n

Criterion Test 01-03-05-03

1. (a) 62802 (b) 78144

2. (a) (150 x 3450) + (24 x 5280) = n

I. U. # 01-03-06

More Multiplication by Multiples of 10, 100, and 1000

You will need to recall:

1. The distributive law of multiplication over addition.

2. The associative law of multiplication.

3. The partial products form of multiplying.

OBJECTIVES:

1. Given two numbers, one of which is a multiple of 10, 100, or 1000, write their product.

2. Given an applied problem, translate it into a number sentence and solve it.

ACTIVITIES:

1. Study pages 83, 84 and do margin exercises 64 - 71. (Objective 1)

2. Study page 84 and do margin exercises 72, 73. (Objective 2)

3. Write exercise set 6 pages 113, 114 (objectives 1,2).

Criterion Test 01-03-06-01

1. Write the product.

   (a) 5736 x 70 (b) 5736 x 700 (c) 5736 x 7000

2. Translate into a number sentence ans solve.

   (a) The six T.V. monitors in the math room cost $75.00 each. What was the total cost?

   (b) The old math room measured 25 ft. by 15 ft., and the new part measures 18 ft. by 15 ft. what is the total area? (Area of a rectangle is its length times its width)

Criterion Test 01-03-06-02

1. Write the product.

   (a) 1492 x 80 (b) 1492 x 8000 (c) 1492 x 800

2. Translate into a number sentence and solve.

   (a) Each chair in the math room cost $14.00. How much did the 26 chairs cost?

(b)

Criterion Test 01-03-06-03

1. Write the product.

   (a) 5280 x 50 (b) 1972 x 200 (c) 2765 x 3000

2. Translate into a number sentence and solve.

   (a) Cal Closefeynd buys 4 shirts at $5.00 each and five neckties at $3.00 each. How much did Closefeynd spend.

Answers to Criterion Tests

Test 01-03-06-01

1. (a) 401520 (b) 4015200 (c) 40152000

2. (a) 6 x 75 = n, n = 450 (b) (25 x 15) + (18 x 15) = n, n = 645

Test 01-03-06-02

1. (a) 119360 (b) 11936000 (c) 1193600

2. 26 x 14 = n, n = 364.

Test 01-03-06-03

1. (a) 264,000 (b) 394,400 (c) 8,295,000

2. (4 x 5)+(5 x 3)= n, n = 35

I. U. # 01-03-07

Extending Multiplication

You will need to recall:

1. The distributive law.
2. How to round numbers to the nearest 10, 100, 1000.

OBJECTIVES:

1. Given two numbers, find their product by the short form.
2. Given two numbers, estimate their product by rounding.
3. Given two numbers containing zeros as digits, write their product using the short form.
4. Given any two whole numbers, write their product.

ACTIVITIES:

1. Study pages 85, 86, AAMA and do margin exercises 74 - 81. (Objective 1)
2. Study page 86, and do margin exercises 82, 83. (Objective 2)
3. Study page 87 and do margin exercises 84 - 88 (Objective 3)
4. Write exercise set 7, pages 115, 116 (Objective 4)

Criterion Test 01-03-07-01

1. Write the products; use the short form; show your work.

   (a) 567 × 789

   (b) 965 × 642

2. (a) Estimate the product by rounding to the nearest 10

   45 x 67

   (b) Estimate the product by rounding to the nearest 100

   432 x 199

   (c) Estimate the product by rounding to the nearest 1000

   6501 x 3449

3. Write the products; use the short form; show your work.

   (a) 305 × 204

   (b) 5080 × 302

4. Find the product.

   (a) 5423 × 22

   (b) 9999 × 9999

   (c) 6005 × 3020

Criterion Test 01-03-07-02

1. Write the product; use the short form; show your work.

   (a) 788 × 976

   (b) 899 × 123

2. (a) Estimate the product by rounding to the nearest 10

   45 x 71

   (b) Estimate the product by rounding to the nearest 100

   579 x 421

   (c) Estimate the product by rounding to the nearest 1000

   5432 x 6599

3. Write the products; use the short form; show your work.

   (a) 509 × 901

   (b) 4060 × 404

4. Find the product.

   (a) 5762 x 28

   (b) 798 x 603

   (c) 9002 x 7090

Criterion Test 01-03-07-03

1. Write the products; use the short form; show your work.

   (a) 533 × 781

   (b) 498 × 721

2. (a) Estimate the product by rounding to the nearest 10

   44 x 35

   (b) Estimate the product by rounding to the nearest 100

   527 x 666

   (c) Estimate the product by rounding to the nearest 1000

   5299 x 5499

3. Write the products; use the short form; show your work

   (a) 606 × 505

   (b) 6070 × 505

4. Find the product.

   (a) 9827 × 716

   (b) 8791 × 1234

   (c) 5090 × 9090

Answers to Criterion Tests

Test 01-03-07-01

1. (a) 567 × 789 = 5103 + 45360 + 396900 = 447363

   (b) 965 × 642 = 1930 + 38600 + 579000 = 619530

2. (a) 3500 (b) 80000 (c) 21,000,000

3. (a) 305 × 204 = 1220 + 61000 = 62220

   (b) 5080 × 302 = 10160 + 1524000 = 1534160

4. (a) 119306 (b) 99,980,001 (c) 18,135,100

Test 01-03-07-02

1. (a) 788 × 976 = 4728 + 55160 + 709200 = 769088

   (b) 899 × 123 = 2697 + 17980 + 89900 = 110577

2. (a) 3500 (b) 240,000 (c) 35,000,000

3. (a) 509 × 901 = 509 + 458100 = 458609

   (b) 4060 × 204 = 16240 + 812000 = 828240

4. (a) 161,336 (b) 481,194 (c) 63,824,180

Answers to Criterion Tests (Cont.)

Test 01-03-07-03

1. (a) 533 × 781 = 416273

   533
   42640
   373100
   416273

   (b) 498 × 721 = 359058

   498
   9960
   348600
   359058

2. (a) 1600 (b) 350,000 (c) 25,000,000

3. (a) 606 × 505 = 306030

   606
   505
   3030
   303000
   306030

   (b) 6070 × 505 = 3065350

   6070
   505
   30350
   3035000
   3065350

4. (a) 7,036,132 (b) 10,848,094 (c) 46,268,100

I. U. # 01-03-08

Basic Division

OBJECTIVES:

1. Given a division sentence, write a related multiplication sentence.

2. Given a multiplication sentence, write two (except in cases where there are only one) related division sentences.

3. Given a division problem such as 16 ÷ 8 or 24 ÷ 8, write its quotient.

4. Given a number divided by one, write the quotient.

5. Given a number greater than zero, divide it by itself and write the quotient.

6. Given a zero, divide it by any number greater than zero and write the quotient.

7. Given a one or two digit whole number, divide it by a single digit whole number and write the quotient.

ACTIVITIES:

1. Study page 88, in AAMA, and do margin exercises 89 - 91. (objective 1)

2. Study page 88, and do margin exercises 92 - 94. (objective 2)

3. Study pages 88, 89, and do margin exercises 95 - 106. (objective 3)

4. Study pages 89, 90, and do margin exercises 107 - 109. (objective 4)

5. Study page 90 and do margin exercises 110 - 121. (objective 6)

6. Study page 91, and do margin exercises 122 - 127. (objective 5)

7. Write exercise set 8 pages 117, 118. (objective 7)

Criterion Test 01-03-08-01

1. Write a related multiplication sentence.

   (a) $18 \div 3 = 6$ (b) $24 \div 8 = 3$

2. Write two related division sentences for

   (a) $3 \times 9 = 27$ (b) $4 \times 5 = 20$

3. Write the quotient

   (a) $54 \div 9$ (b) $56/8$

4. Write the quotient

   (a) $54 \div 1$ (b) $56/1$

5. Write the quotient

   (a) $43 \div 43$ (b) $14/14$

6. Write the quotient

   (a) $0 \div 24$ (b) $0/16$

7. Write the quotient

   (a) $9\overline{)45}$ (b) $42 \div 7$

   (c) $40/8$

Criterion Test 01-03-08-02

1. Write a related multiplication sentence.

   (a) $35 \div 7 = 5$ (b) $45 \div 5 = 9$

2. Write two related division sentences.

   (a) $4 \times 7 = 28$ (b) $6 \times 8 = 48$

3. Write the quotient

   (a) $63 \div 9$ (b) $42/7$

4. Write the quotient

   (a) $37 \div 1$ (b) $14/1$

5. Write the quotient

   (a) $17 \div 17$ (b) $17\overline{)17}$

6. Write the quotient

   (a) $0/5$ (b) $0 \div 23$

7. Write the quotient

   (a) $5\overline{)45}$ (b) $36 \div 6$

   (c) $9\overline{)72}$

Criterion Test 01-03-03-03

1. Write a related multiplication sentence.

   (a) $63 \div 9 = 7$ (b) $56 \div 8 = 7$

2. Write two related division sentences.

   (a) $6 \times 4 = 24$ (b) $7 \times 6 = 42$

3. Write the quotient

   (a) $32 \div 8$ (b) $56/7$

4. Write the quotient

   (a) $16/1$ (b) $1\overline{)16}$

5. Write the quotient

   (a) $93/93$ (b) $14 \div 14$

6. Write the quotient

   (a) $0/1$ (b) $0/2$

7. Write the quotient

   (a) $64 \div 8$ (b) $63/7$

   (c) $6\overline{)54}$

Answers:

Criterion Test 01-03-08-01

1. (a) 3 x 6 = 18 (b) 8 x 3 = 24

2. (a) 27 ÷ 3 = 9
27 ÷ 9 = 3
(b) 20 ÷ 4 = 5
20 ÷ 5 = 4

3. (a) 6 (b) 7

4. (a) 54 (b) 56

5. (a) 1 (b) 1

6. (a) 0 (b) 0

7. (a) 5 (b) 6 (c) 5

Criterion Test 01-03-08-02

1. (a) 7 x 5 = 35 (b) 5 x 9 = 45

2. (a) 28 ÷ 7 = 4
28 ÷ 4 = 7
(b) 48 ÷ 8 = 6
48 ÷ 6 = 8

3. (a) 7 (b) 6

4. (a) 37 (b) 14

5. (a) 1 (b) 1

6. (a) 0 (b) 0

7. (a) 9 (b) 6 (c) 8

Answers (continued)

Criterion Test 01-03-08-03

1.	(a)	9 x 7 = 63	(b)	8 x 7 = 56		
2.	(a)	24 ÷ 4 = 6 24 ÷ 6 = 4	(b)	42 ÷ 7 = 6 42 ÷ 6 = 7		
3.	(a)	4	(b)	8		
4.	(a)	16	(b)	16		
5.	(a)	1	(b)	1		
6.	(a)	0	(b)	0		
7.	(a)	8	(b)	9	(c)	9

I. U. # 01-03-09

Division by Guess, Multiply and Subtract

OBJECTIVES:

1. Given a division problem, find its quotient by the "guess, multiply, subtract" method.

ACTIVITIES:

1. Study pages 92 - 94 in AAMA, and do margin exercises 133 - 138 (Objective 1)

2. Write exercise set 9, pages 119, 120 (Objective 1)

Criterion Test 01-03-09-01

1. Divide by guess, multiply, subtract and show your work.

   (a) $42\overline{)9011}$

Criterion Test 01-03-09-02

1. Divide by guess, multiply, and subtract and show your work.

   (a) $41\overline{)6788}$

Criterion Test 01-03-09-02

1. Divide by guess, multiply, and subtract and show your work.

   (a) $42\overline{)1506}$

Answers to Criterion Tests

Tests 01-03-09-01, 02, and 03

There are too many possible correct ways to work these problems to list them all here. Check your work with the teacher and he will tell you if you have used the "guess, multiply, subtract" method of division correctly.

I. U. 01-03-10

Division by Estimating Multiples of Thousands, Hundreds, Tens and Ones

You will need to recall:

1. What is meant by "multiples of thousands, hundreds", and so on.

OBJECTIVES:

1. Given a division problem, find the quotient by estimating multiples of thousands, hundreds, tens, and ones.

2. Given a division problem, write its solution using the short form.

3. Given a number sentence requiring a division for its solution, write its solution.

4. Given an applied problem, translate it into a number sentence, then solve the number sentence using the method of estimating multiples of thousands, hundreds, tens, and ones.

ACTIVITIES:

1. Study pages 95, 96 and do margin exercises 139 - 145. (Objective 1)

2. Study page 97 and do margin exercises 146 - 148. (Objective 2)

3. Study page 98 and do margin exercises 149 - 152. (Objective 3)

4. Study page 98 and do margin exercises 153, 154. (Objective 4)

5. Write exercise set 10, pages 121, 122. (Objectives 1 - 4)

Criterion Test 01-03-10-01

1. Find the quotient using multiples of thousands, hundreds, tens, ones method. Show your work.

   $13 \overline{)\ 1506}$

2. Work problem one using the short form. Show your work.

3. Solve.

   (a) $3 \times n = 963$ (b) $\frac{6 \times 10}{3} = n$

4. Write a number sentence and solve.

   (a) Seven times a number is 224. What is the number?

Criterion Test 01-03-10-02

1. Find the quotient using the multiples of thousands, hundreds, tens, ones method.

   $32 \overline{)\ 9754}$

2. Work problem one using the short form. Show your work.

3. Solve.

   (a) $4 \times n = 840$ (b) $\frac{12 \times 5}{4} = n$

4. Write a number sentence and solve.

   (a) Wendell Payne bought $1800 worth of glass. If each piece costs $45, how many pieces did he buy?

Criterion Test 01-03-10-03

1. Find the quotient using the multiples of thousands, hundreds, tens, ones method.

   $23 \overline{)\ 1506}$

2. Work problem one using the short form. Show your work.

3. Solve.

   (a) $5 \times n = 50$ (b) $\frac{3 \times 35}{5} = n$

4. Write a number sentence and solve. Four

   (a) Four times a number is 832. Find the number.

Answers to Criterion Tests

Test 01-03-10-01

1.
$$
\begin{array}{r}
115\ \text{R1} \\
13\ \overline{)\ 1506} \\
1300 \\
\hline
206 \\
130 \\
\hline
66 \\
65 \\
\hline
1
\end{array}
$$
$1300 = 13 \times 100$, $130 = 13 \times 10$, $65 = 13 \times 5$

2.
$$
\begin{array}{r}
115\ \text{R1} \\
13\ \overline{)\ 1506} \\
1300 \\
\hline
206 \\
130 \\
\hline
66 \\
65 \\
\hline
1
\end{array}
$$

3. (a) 321 (b) 20

4. (a) $7n = 224$, $n = 32$

Answers to Criterion Tests (Cont.)

Test 01-03-10-02

1.
$$\begin{array}{r} 304\ R16 \\ 32\ \overline{)\ 9754} \\ \underline{9600} \\ 154 \\ \underline{128} \\ 16 \end{array} \quad \begin{array}{l} \\ \\ \\ = 32 \times 300 \\ \\ = 32 \times 4 \end{array}$$

2.
$$\begin{array}{r} 304\ R16 \\ 32\ \overline{)\ 9754} \\ \underline{9600} \\ 154 \\ \underline{128} \\ 16 \end{array}$$

3. (a) 210 (b) 15

4. $\frac{1800}{45} = n$ or $45n = 1800$, $n = 40$

Answers to Criterion Tests (Cont.)

Test 01-03-10-03

1.
$$\begin{array}{r} 65\ \text{R}11 \\ 23\overline{)\ 1506} \\ \underline{1380} \quad = 23 \times 60 \\ 126 \\ \underline{115} \quad = 23 \times 5 \\ 11 \end{array}$$

2.
$$\begin{array}{r} 65\ \text{R}11 \\ 23\overline{)\ 1506} \\ \underline{1380} \\ 126 \\ \underline{115} \\ 11 \end{array}$$

3. (a) 10 (b) 21

4. $4n = 832, n = 208$

I. U. # 01-03-11

Short Cuts for Division

OBJECTIVE:

Given a division problem, show the short form for finding its quotient.

ACTIVITIES:

1. Study pages 99 - 101 and do margin exercises 155 - 162 (objective 1).

2. Study "Zeros in Quotients" on pages 101 - 102. Be expecially careful when working problems with zeros in the quotient as this is a common source of error in division problems. Do margin exercises 163 - 168 (objective 1).

3. Write exercise set 11, pages 123, 124 (objective 1).

Criterion Test 01-03-11-01

1. Show the short form for finding the quotient.

   $89\overline{)29103}$

Criterion Test 01-03-11-02

1. Show the short form for finding the quotient.

   $53\overline{)45,498}$

Criterion Test 01-03-11-03

1. Show the short form for finding the quotient.

   $73\overline{)41,173}$

Answers:

Criterion Test 01-03-11-01

1.

```
      327
  89|29103
    26700
     2403
     1780
      623
      623
```

Criterion Test 01-03-11-02

1.

```
      858 R 24
  53|45498
    42400
     3098
     2650
      448
      424
       24
```

Criterion Test 01-03-11-03

1.

```
      564 R 1
  73|41173
    36500
     4673
     4380
      293
      292
        1
```

The End of Package 01-03