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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 presents problems in multiplication and division with decimal numbers. This work was prepared under an ESEA Title III contract. (JP)

Once you have mastered multiplication and division of decimal numerals you will probably agree that decimal numerals are the most convenient method of working with fractions. The metric system of measurements is based on the decimal system. Per Cent and interest problems require an understanding of arithmetic operations with decimal numerals.

The Goal of this package is:

For you to be able to multiply and divide with decimal numerals and to be able to solve related applied problems.

PACKAGE OBJECTIVES:

1. Given a multiplication problem in which at least one decimal numeral is involved, write the product and solve related applied problems.

2. Given a problem involving multiplication with decimal numerals, place the decimal point by estimating the product.

3. Given any division problem involving decimal numerals, find the quotient and solve related applied problems.

4. Given a fractional numeral, convert it to a decimal numeral and if the result is a repeating decimal round it to the nearest tenth, hundredth, or thousandth, and solve related applied problems.

I. U. #01-08-01

Multiplication with Decimals

You will need to recall:

How to multiply whole numbers. Multiplication with decimals is similar to multiplication with whole numbers.

OBJECTIVES:

1. Given a multiplication problem in which at least one decimal numeral is involved, write the product, and solve related applied problems.

ACTIVITIES:

1. Study pages 231 - 255, AAMA, and do margin exercises 1 - 24. (Objective 1)

2. Write exercise set 1, odd exercises pages 245, 246. (Objective 1)

Criterion Test 01-08-01-01

1. Write the product.

   (a) 42.75 x .504

   (b) 13.06 x .022

   (c) Solve.

   A car races at 148.7 miles per hour for .25 hours. How far does it go?

Criterion Test 01-08-01-02

1. Write the product.

   (a) 3.02 x 2.55

   (b) 20.02 x .036

   (c) Solve.

   What is the cost of 10.7 gallons of gasoline at 34.9 cents per gallon?

Criterion Test 01-08-01-03

1. Write the product.

   (a) 5.09 x .0701

   (b) 2.75 x 300

   (c) Solve.

   What is the cost of 9.4 gallons of gasoline at 36.9 cents per gallon?

Answers to Criterion Tests

Test 01-08-01--01

1. (a) 21.546 (b) .28732 (c) 37.175 miles

Test 01-08-01-02

1. (a) 7.7010 (b) .72072

(c) $3.73 or $3.7343 or 373¢

Test 01-08-01-03

1. (a) .356809 (b) 825 (c) $3.47 or 347¢ or $3.4686

I. U. # 01-08-02

Placing Decimal Points by Estimating

You will need to recall:

How to estimate a product of whole numbers.

OBJECTIVES:

1. Given a problem involving multiplication of decimal numerals, estimate the product by rounding.

2. Given a problem involving multiplication with decimal numerals, place the decimal point by estimating the product.

ACTIVITIES:

1. Study pages 236, 237, AAMA, and do margin exercises 25 - 37. (Objectives 1, 2)

2. Write exercise set 2, odd problems pages 247, 248. (Objectives 1, 2)

Criterion Test 01-08-02-01

1. Estimate by rounding to one nonzero digit.

   (a) 52.80 x 276.5

   (b) .00367 x .000123

   (c) 52.765 x 12.1

2. Make a true statement by estimating the product and placing the decimal point in the given product.

   (a) 52.80 x 276.5 = 14599200

   (b) .00367 x .000123 = 45141

   (c) 52.765 x 12.1 = 6384565

Criterion Test 01-08-02-02

1. Estimate by rounding to one nonzero digit.

   (a) 212.57 x 575.26

   (b) .000123 x 357.22

   (c) 50.05 x 2.0202

2. Make a true statement by estimating the product and placing the decimal point in the given product.

   (a) 212.57 x 575.26 = 1222830182

   (b) .000123 x 357.22 = 4393806

   (c) 50.05 x 2.0202 = 101111010

Criterion Test 01-08-02-03

1. Estimate by rounding to one nonzero digit.

   (a) 123.456 x .20202

   (b) 505.05 x 321.17

   (c) 3.9201 x .00321

2. Make a true statement by estimating the product and placing the decimal point in the given product.

   (a) 123.456 x .20202 = 2494058112

   (b) 505.05 x 321.17 = 1622069085

   (c) 3.9201 x .00321 = 1258320

Answers to Criterion Tests

Test 01-08-02-01

1. (a) 50 x 300 = 15,000

   (b) .004 x .0001 = .0000004

   (c) 50 x 10 = 500

2. (a) 52.80 x 276.5 = 14,599.200

   (b) .00367 x .000123 = .00000045141

   (c) 52.765 x 12.1 = 638.4565

Test 01-08-02-02

1. (a) 200 x 600 = 120,000

   (b) .0001 x 400 = .04

   (c) 50 x 2 = 100

2. (a) 212.57 x 575.26 = 122,283.0182

   (b) .000123 x 357.22 = .04393806

   (c) 50.05 x 2.0202 = 101.111010

Test 01-08-02-03

1. (a) 100 x .2 = 20

   (b) 500x 300 = 150,000

   (c) 4 x .003 = .012

2. (a) 123.456 x .20202 = 24.94058112

   (b) 505.05 x 321.17 = 162,206.9085

   (c) 3.9201 x .00321 = .01258320

I. U. # 01-08-03

Division with Decimals

You will need to recall:

How to divide using whole numbers.

OBJECTIVES:

1. Given a division problem in which the dividend is a decimal numeral and the divisor is a whole number, write the quotient.

2. Given a division problem in which extra zeros are needed in the dividend, find the quotient.

3. Given a division problem in which the divisor is a decimal numeral and the dividend is either a whole number or a decimal numeral, find the quotient.

4. Given a division problem involving decimal numerals, place the decimal point in the quotient by estimating.

5. Given any division problem involving decimal numerals, find the quotient.

ACTIVITIES:

1. Study "Whole Numbers" and "Extra Zeros" pages 238, 239 AAMA, and do margin exercises 38 to 45. (Objective 2)

2. Study "Divisiors Which Are Not Whole Numbers" page 239, and do margin exercises 46, 47. (Objective 1)

3. Study "Placing Decimal Points By Estimating" page 240, and do margin exercises 48 - 51. (Objectives 3,4)

4. Write exercise set 3, odd problems, pages 249, 250. (Objective 5)

Criterion Test 01-08-03-01

1. Write the quotient.

   $6\overline{)24.36}$

2. Find the quotient.

   $25\overline{)\ 5}$

3. Find the quotient.

   $2.5\overline{)\ 35.5}$

4. Place the decimal point by estimating the quotient.

   $2.3\overline{)\ 126.24}$

5. Solve.

   A man walked 9.75 miles in 4 hours. How far did he walk in 1 hour?

Criterion Test 01-08-03-02

1. Write the quotient. (To the nearest thousandth.)

   $24\overline{)\ 17.32}$

2. Find the quotient. (To the nearest thousandth.)

   $13\overline{)\ 4}$

3. Find the quotient.

   $4.5\overline{)\ 20.5}$

4. Place the decimal point by estimating the quotient.

   $15.76\overline{)\ 47.76}$

5. Solve.

   A steer gained 3.46 pounds per day while he was on full feed. If he gained 363.3 pounds, how long was he on full feed?

Criterion Test 01-08-03-03

1. Write the quotient. (To the nearest thousandth.)

   $275\overline{)375.5}$

2. Find the quotient. (To the nearest thousandth.)

   $75\overline{)25}$

3. Find the quotient. (To the nearest millionth.)

   $13.6\overline{).0075}$

4. Place the decimal point by estimating the quotient.

   $2.5\overline{)6.25}$

5. Solve.

   The amount of flotation produced by one cubic foot of styrofoam is 62.5 pounds. How many cubic feet of styrofoam would it take to produce 2000 pounds of flotation?

Answers to Criterion Tests

Test 01-08-03-01

1. 4.06

2. .2

3. 14.2

4. estimate - 126 ÷ 2 = 63 or 120 ÷ 2 = 60 or 100 ÷ 2 = 50
answer - 54.887 to the nearest thousandth

5. 2.4375 miles

Test 01-08-03-02

1. .722 to the nearest thousandth

2. .308 to the nearest thousandth

3. 4.556 to the nearest thousandth

4. estimate - 47 ÷ 15 = 3.1 or 50 ÷ 20 = 2.5
answer - 3.030 to the nearest thousandth

5. 105 days

Test 01-08-03-03

1. 1.365 to the nearest thousandth

2. .333 to the nearest thousandth

3. .000551 to the nearest millionth

4. estimate - 6 ÷ 2 = 3
answer - 2.5

5. 32. cubic feet of styrofoam.

I. U. #01-08-04

Fractional Numerals and Decimals

You will need to recall:

1. How to rename a fractional numeral by multiplying by one ($\frac{5}{5}$ or $\frac{3}{3}$ etc.)

2. How to divide by whole numbers.

3. How to round numbers.

OBJECTIVES:

1. Given a fractional numeral, convert it to a decimal numeral and if the result is a repeating decimal round it to the nearest tenth, hundredth, or thousandth, and solve related applied problems.

ACTIVITIES:

1. Study pages 241 - 243, AAMA, and do margin exercises 52 - 66. (Objective 1)

2. Write exercise set 4, odd problems, pages 251 - 254. (Objective 1)

Criterion Test 01-08-04-01

1. Convert to a decimal numeral.

   (a) $\frac{11}{20}$ (b) $\frac{37}{25}$

   (c) Convert to a decimal and round to the nearest hundredth.

   $\frac{7}{11}$

   (d) Convert to a decimal and round to the nearest thousandth.

   $\frac{7}{9}$

Criterion Test 01-08-04-02

1. Convert to a decimal numeral.

   (a) $\frac{13}{25}$ (b) $\frac{2402}{125}$

   (c) Convert to a decimal numeral and round to the nearest hundredth.

   $\frac{5}{12}$

   (d) Convert to a decimal numeral and round to the nearest thousandth.

   $\frac{11}{12}$

Criterion Test 01-08-04-03

1. Convert to a decimal numeral.

   (a) $\frac{23}{40}$ (b) $\frac{1}{20}$

   (c) Convert to a decimal and round to the nearest thousandth.

   $\frac{6}{7}$

   (d) Convert to a decimal and round to the nearest hundredth.

   $\frac{14}{11}$

Answers to Criterion Tests

Test 01-08-04-01

1. (a) .55 (b) 1.48 (c) .64

   (d) .778

Test 01-08-04-02

1. (a) .52 (b) 19.216 (c) .42

   (d) .917

Test 01-08-04-03

1. (a) .575 (b) .05 (c) .85

   (d) 1.27

THE END

Package 01-08