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AUTHOR	Thompson, Russ; Fuller, Albert
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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. Work in this package centers on measurement. Problems are presented for converting from one unit to another within a system and from the British system to the metric system. Area and volume measurement of various geometrical figures are also among the topics covered. This work was prepared under an ESEA Title III contract. (JP)

BASIC MATH I

Package 01-10

MEASURES

Prepared By

Russ Thompson and Albert Fuller

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MEASURES

You already know that measurements are important to you. Many of the things that you buy are purchased in measured amounts; milk in quarts and gallons, rope in feet and yards, land in acres, sugar in pounds, shingles in squares (100 square feet), lumber in board feet (one square foot one inch thick), etc.

Furthermore, science is dependent on measurements. If you are interested in science, you will want to understand the metric system of measurement. In our country a changeover to the metric system is now in process. So it would be valuable for you to become familiar with this system now.

For some persons the measurement of areas, volumes, and perimeters is very important and is used almost every day. For anyone, an understanding of the meaning of these terms and a knowledge of how to find them will be valuable at some time.

The Goal of this package:

That you will understand measurements well enough that you can solve the kind of problems dealing with measurements which you are likely to encounter.

PACKAGE OBJECTIVES:

1. Given a measurement of length in one of the British American units, convert it to any of the other British American units of length.

2. Given a measurement of length in one of the metric system units, convert it to any of the other metric system units of length.

3. Given a rectangle or a square, find its perimeter and area and solve related applied problems.

4. Given the area of a region in one of the British American square units, find its area in any of the other British American square units.

5. Given a trapezoid, triangle, or parallelogram, find its area.

6. Given a circle, find its circumference and area.

7. Given an applied problem dealing with volume or capacity, solve it.

8. Given a problem dealing with weight, mass, or time, solve it.

I.U. #01-10-01

LINEAR MEASURES

OBJECTIVE:

Given a measurement of length in one of the British-American units, convert it to any of the other British-American units of length.

ACTIVITIES:

1. Study pages 291 - 293 and do the margin exercises. (Objective 1)

2. You may want to try some of the exercises from exercise set 1 on pages 293 - 294. These are related to Objective 1. The answers to the odd numbered exercises are in the back of the book.

CRITERION TESTS

Criterion Test 01-10-01-01

1. Complete:

(a)	5 feet = _____ yards	(d)	20 inches = _____ feet
(b)	10 rods = _____ yards	(e)	25 feet = _____ rods
(c)	15 miles = _____ feet	(f)	30 feet = _____ yards

Criterion Test 01-10-01-02

1. Complete:

(a)	10 rods = _____ feet	(d)	100 yards = _____ feet
(b)	48 feet = _____ yards	(e)	3½ miles = _____ feet
(c)	48 inches = _____ feet	(f)	880 yards = _____ miles

Criterion Test 01-10-01-03

1. Complete:

(a)	35 yards = _____ inches	(d)	50 inches = _____ rods
(b)	40 feet = _____ rods	(e)	55 feet = _____ miles
(c)	45 miles = _____ yards	(f)	60 inches = _____ feet

ANSWERS TO CRITERION TESTS:

Criterion Test 01-10-01-01

1. (a) $1\frac{2}{3}$ yards or $1.6\overline{6}$
   (b) 55 yards
   (c) 79,200 feet
   (d) $1\frac{2}{3}$ feet or $1.6\overline{6}$ feet
   (e) $1\frac{17}{33}$ rods or 1.52 rods to the nearest hundredth.
   (f) 10 yards

Criterion Test 01-10-01-02

1. (a) 165 feet
   (b) 16 yards
   (c) 4 feet
   (d) 300 feet
   (e) 18,480 feet
   (f) $\frac{1}{2}$ mile or .5 mile

Criterion Test 01-10-01-03

1. (a) 1260 inches
   (b) $2\frac{14}{33}$ rods or 2.42 to the nearest hundredth
   (c) 79,200 yards
   (d) $\frac{25}{99}$ rods or .25 rods to the nearest hundredth
   (e) $\frac{1}{96}$ mile or .01 mile to the nearest hundredth
   (f) 5 feet

I. U. # 01-10-02

METRIC SYSTEM

You will need to recall:

How to multiply by multiples of 10 and fractions like $\frac{1}{10}$, $\frac{1}{100}$, $\frac{1}{1000}$ etc.

OBJECTIVES:

1. Given a measurement of length in one of the metric system units, convert it to any of the other metric system units of length.

ACTIVITIES:

1. Memorize the meanings of the metric system prefixes.

   Kilo - 1000
   Hecto - 100
   Deka - 10

   Deci - $\frac{1}{10}$

   Centi - $\frac{1}{100}$

   Milli - $\frac{1}{1000}$

2. Study pages 294 - 296, AAMA, and do the margin exercises.

3. Exercise set 2 pages 317, 318 is related to this instructional unit and you may wish to try it. The answers to the odd numbered problems are in the back of the book.

Criterion Test 01-10-02-01

1. (a) Convert 2587 meters to kilometers.

   (b) Convert 2587 meters to centimeters

   (c) Convert 55.55 centimeters to millimeters.

   (d) Convert 729 millimeters to meters.

   (e) Convert 729 kilometers to meters.

Criterion Test 01-10-02-02

1. (a) Convert 1769 millimeters to kilometers.

   (b) Convert 1769 millimeters to hectometers.

   (c) Convert 1769 millimeters to dekameters.

   (d) Convert 1769 millimeters to meters.

   (e) Convert 1769 millimeters to decimeters.

Criterion Test 01-10-02-03

1. (a) Convert 155.732 meters to kilometers.

   (b) Convert 155.732 meters to millimeters.

   (c) Convert 155.732 meters to centimeters.

   (d) Convert 155.732 meters to decimeters.

   (e) Convert 155.732 meters to dekameters.

Answers to Criterion Tests

Test 01-10-02-01

1. (a) 2.587 kilometers

   (b) 258700 centimeters

   (c) 555.5 millimeters

   (d) .729 meters

   (e) 729000 meters

Test 01-10-02-02

1. (a) .001769 kilometers

   (b) .01769 hectometers

   (c) .1769 dekameters

   (d) 1.769 meters

   (e) 17.69 decimeters

Test 01-10-02-03

1. (a) .155732 kilometers

   (b) 155732 millimeters

   (c) 15573.2 centimeters

   (d) 1557.32 decimeters

   (e) 15.5732 dekameters

I.U. #01-10-03

PERIMETER AND AREA

OBJECTIVES:

1. Given the sides of a polygon, find its perimeter.

2. Given the length and width of a rectangle, find its area.

3. Given one side of a square, find its area.

4. Given a rectangle or a square, find its perimeter and area and solve related applied probl ms.

ACTIVITIES:

1. Study "Perimeter", pages 297 - 298 in AAMA, and do margin exercises 32 through 39. (Objective 1)

2. Study "Area", pages 299 - 300 in AAMA, and do margin exercises 40 through 47. (Objectives 2 and 3)

3. The exercises on pages 319 and 321 are related to Objectives 1 through 3. You may try them if you wish. The answers to the odd numbered problems are in the back of the book.

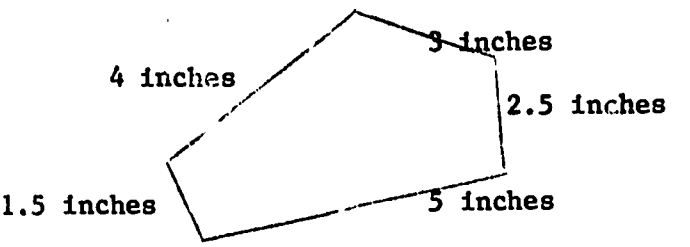
4. The applied problems on pages 320 and 322 will give you practice on Objective 3 for solving applied problems.

CRITERION TESTS:

Criterion Test 01-10-03-01

1. Find the perimeter:

   (a)



   (b) A rectangle 3 inches wide and 4 inches long

   (c) A square with one side 5 inches long.

2. Find the area of a rectangle whose length is 9 inches and whose width is 3 inches.

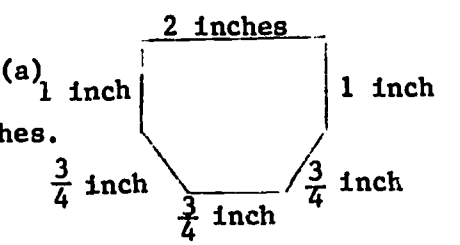
3. Find the area of a square that has one side of 4 feet.

4. This sheet of paper is $8\frac{1}{2}$ inches by 11 inches.
   (a) What is its perimeter?
   (b) What is its area?

Criterion Test 01-10-03-02

1. Find the perimeter:

   (a)



   (b) a rectangle 10 inches by 5 inches.

   (c) A square 8 inches on one side.

2. Find the area of a rectangle 10 inches by 5 inches.

3. Find the area of a square 8 inches on a side.

4. If a midget baseball diamond is a square 80 feet on a side,

   (a) What is its perimeter?

   (b) What is its area?

Criterion Test 01-10-03-03

1. (a) Find the perimeter of a hexagon (six sides) if each side is 2 inches long.

   (b) Find the perimeter of a rectangle whose side is 4 inches long and whose length is 12 inches.

   (c) What is ther perimeter of a square mile (1 section of land) in feet? (one mile = 5280 feet)

2. Find the area of a rectangle 14 feet by 28 feet.

3. Find the area of a section of land in square feet.

4. (a) A garden is 30 feet wide and 60 feet long. How many feet of fence will it take to enclose it?

   (b) A rod is $16\frac{1}{2}$ feet, and a mile is 5280 feet. How many square feet are in a rectangle 1 rod wide and $\frac{1}{2}$ mile long?

ANSWERS TO CRITERION TESTS

Criterion Test 01-10-03-01

1. (a) 16 inches (b) 14 inches (c) 20 inches
2. 27 square inches
3. 16 square feet
4. (a) 39 inches (b) $93\frac{1}{2}$ square inches

Criterion Test 01-10-03-02

1. (a) $6\frac{1}{4}$ inches (b) 30 inches (c) 32 inches
2. 50 square inches
3. 64 square inches
4. (a) 320 feet (b) 6,400 square feet

Criterion Test 01-10-03-03

1. (a) 12 inches or 1 foot (b) 32 inches (c) 21,120 feet
2. 392 square feet
3. 27,878,400 square feet
4. (a) 180 feet (b) 43,560 square feet

I. U. #01-10-04

BRITISH - AMERICAN SQUARE UNITS OF AREA

You will need to recall:

1. That: 12 inches = 1 foot
   3 feet = 1 yard
   $16\frac{1}{2}$ feet = 1 rod
   5280 feet = 1 mile
   320 rods = 1 mile

OBJECTIVES:

1. Given the area of a region in one of the British American square units, find its area in any of the other British American square units, and solve related applied problems.

ACTIVITIES:

1. Study pages 301, 302, AAMA. Memorize the table of square units if you wish, but be sure that you know the linear units mentioned in "You will need to recall". (Objective 1)

2. Do the margin exercises 48 - 55, pages 301, 302. (Objective 1)

3. Exercise set 5 on pages 325, 326 are related to objective 1. You may do as many of them as you choose. Most practical application problems can be reworded into statements similar to these exercises.

Criterion Test 01-10-04-01

1. (a) 5 feet^2 = _____ inches^2

   (b) 10 yard^2 = _____ feet^2

   (c) 15 rods^2 = _____ yards^2

   (d) 20 acres = _____ rods^2

   (e) 25 miles^2 = ____ acres

Criterion Test 01-10-04-02

1. (a) 25 inches^2 = _____ feet^2 to the nearest thousandth

   (b) 50 feet^2 = _____ yards^2

   (c) 75 yards^2 = _____ rods^2 to the nearest thousandth

   (d) 100 rods^2 = _____ acres

   (e) 150 acres = _____ miles^2 to the nearest thousandth

Criterion Test 01-10-04-03

1. (a) 25 inches^2 = _____ yards^2 to the nearest thousandth

   (b) 50 feet^2 = _____ rods^2 to the nearest thousandth

   (c) 75 yards^2 = _____ acres to the nearest thousandth

   (d) 100 rods^2 = _____ miles^2 to the nearest ten thousandth

   (e) 150 feet^2 = _____ rods^2 to the nearest thousandth

Answers to Criterion Tests

Test 01-10-04-01

1. (a) 720 inches^2

   (b) 90 feet^2

   (c) 453 $\frac{3}{4}$ yards^2

   (d) 3200 rods^2

   (e) 16,000 acres

Test 01-10-04-02

1. (a) .174 feet^2 to the nearest thousandth

   (b) $\frac{5}{9}$ or $5.\overline{5}$ yards ^{2}

   (c) 2.479 rods^2 to the nearest thousandth

   (d) .625 acres

   (e) .234 miles^2 to the nearest thousandth

Test 01-10-04-03

1. (a) .019 yards^2 to the nearest thousandth

   (b) .184 rods^2 to the nearest thousandth

   (c) 2.479 acres to the nearest thousandth

   (d) .0010 miles^2 to the nearest ten thousandth

   (e) .551 rods^2 to the nearest thousandth

I.U. #01-10-05

AREA OF PARALLELOGRAMS, TRIANGLES, AND TRAPEZOIDS

OBJECTIVES:

1. Given the length of the base and the height of a parallelogram, find its area.

2. Given the length of the base and the height of a triangle, find its area.

3. Given the length of the two parallel sides (bases) of a trapezoid and its height, find its area.

4. Given the necessary dimensions, find the areas of parallelograms, trianlges, and trapezoids, and solve related applied problems.

ACTIVITIES:

1. Study page 303 "Parallelograms", and do margin exercises 56 and 57. (Objective 1)

2. Study page 304 "Triangles", and do margin exercises 58 and 59. (Objective 2)

3. Study page 305 "Trapezoids", and do margin exercises 60 and 61. (Objective 3)

4. The exercise set 6 on page 327 is related to these objectives and you may wish to practice with them. The exercises and problems on page 328 are more important because they give you a chance to practice on that part of Objective 4 which says "and solve related applied problems." (Objective 4)

CRITERION TESTS

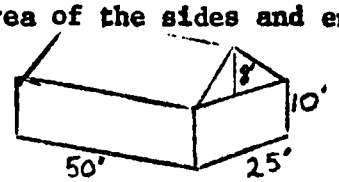
Criterion Test 01-10-05-01

1. Find the area of a parallelogram whose base is 10 inches and whose height is 5 inches.

2. Find the area of a triangle whose base is 10 inches and height is 5 inches.

3. Find the area of a trapezoid whose parallel sides are 8 inches and 16 inches long and whose height is 5 inches.

4. Find the area of the sides and ends of this building.



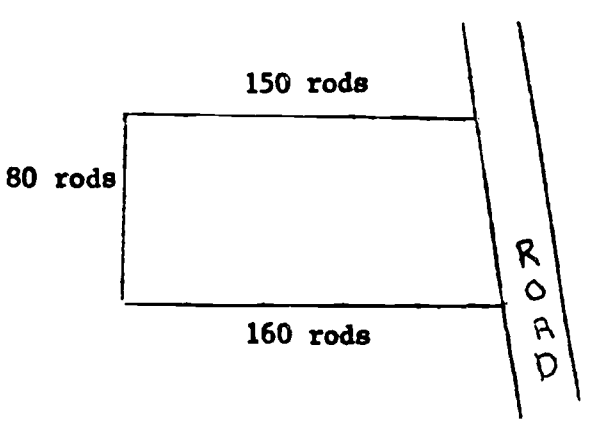
Criterion Test 01-10-05-02

1. Find the area of a parallelogram whose base is 100 feet and whose height is 25 feet.

2. Find the area of a triangle whose base is 100 feet and whose height is 25 feet.

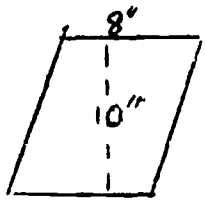
3. Find the area of a trapezoid whose bases are 100 feet and 50 feet and whose height is 25 feet.

4. Solve: A farmer bought a field that has a road running across one end of it. If the dimensions are as shown in the following drawing, how many square rods are in the field?

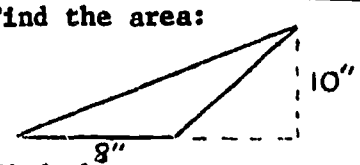


Criterion Test 01-10-05-03

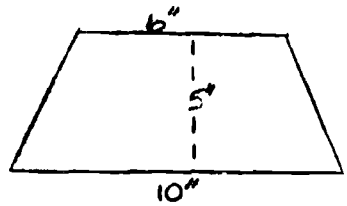
1. Find the area:



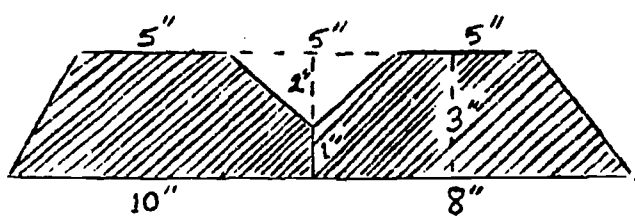
2. Find the area:



3. Find the area:



4. Find the area of the shaded part:



ANSWERS TO CRITERION TESTS

Criterion Test 01-10-05-01

1. 50 square inches
2. 25 square inches
3. 60 square incnes
4. 1700 square feet

Criterion Test 01-10-05-02

1. 2500 square feet
2. 1250 square feet
3. 1875 square feet
4. 12,400 square rods

Criterion Test 01-10-05-03

1. 80 square inches
2. 40 square inches
3. 40 square inches
4. 44.5 square inches

I. U. #01-10-06

CIRCLES

OBJECTIVES:

1. Given a circle, identify its diameter and radius.

2. Given the radius or diameter of a circle, find its circumference.

3. Given the diameter or radius of a circle, find its area, and solve related applied problems.

ACTIVITIES:

1. Study pages 306, 307 and do margin exercises 62 - 66. (Objectives 1, 2)

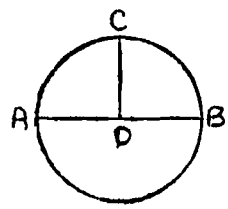
2. Study page 308 and do margin exercises 67, 68. (Objective 3)

3. The exercise set 7 on pages 329 - 321 are related to objectives 1, 2, 3 and you may want to practice with them. The applied problems on pages 331 and 332 should be worked to help you achieve the last part of objective 3.

CRITERION TESTS

Criterion Test 01-10-06-01

1. Identify the diameter and radius:



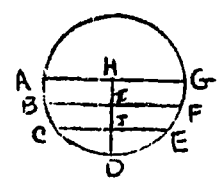
2. Find the circumference of a circle whose diameter is 7 inches. (Use $\frac{22}{7}$ for π.)

3. (a) Find the area of a circle whose radius is 10 inches. (Use 3.14 for π.)

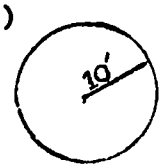
   (b) Solve: A radio station is allowed to broadcast over an area 150 miles in radius. How large an area is this? (Use 3.14 for π.)

Criterion Test 01-10-06-02

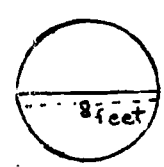
1. Identify the diameter and radius:



2. Find the circumference . (Use 3.14 for π.)



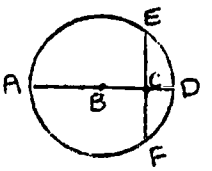
3. (a) Find the area. (Use 3.14 for π.)



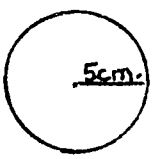
   (b) Solve: A circular grain bin has a radius of 15 feet. What is the area of the bin's floor? (Use 3.14 for π.)

Criterion Test 01-10-06-03

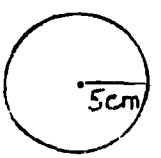
1. Identify the diameter and radius:



2. Find the circumference. (Use 3.14 for π.)



3. (a) Find the area. (Use 3.14159 for π.)



(b) Solve: The free throw circle has a diameter of 12 feet. When a player shoots a free throw, he may stand anywhere back of the free throw line, which is a diameter. How many square feet does the free thrower have to stand on? (use 3.14 for π)

ANSWERS TO CRITERION TESTS

Criterion Test 01-10-06-01

1. $\overline{AB}$ is the diameter. $\overline{CD}$, $\overline{AD}$, and $\overline{BD}$ are each radii. (Radii is the plural of radius.)

2. 22 inches

3. (a) 314 square inches (b) 70,650 square miles

Criterion Test 01-10-06-02

1. $\overline{AG}$ is a diameter. $\overline{HD}$, $\overline{AH}$, and $\overline{GH}$ are radii.

2. 62.8 feet

3. (a) 50.24 square feet (b) 706.50 square feet

Criterion Test 01-10-06-03

1. $\overline{AD}$ is a diameter. $\overline{AB}$ and $\overline{BD}$ are radii.

2. 31.4 centimeters

3. (a) 78.54 square centimeters (b) 56.52 square feet

I. U. #01-10-07

VOLUME AND CAPACITY

OBJECTIVES:

1. Given the length, width, and height of a rectangular solid, find its volume.

2. Given the capacity of a container in one of the British - American dry measure units, convert it to any of the other British - American dry measure units.

3. Given the capacity of a container in one of the British - American units of liquid measure, convert it to any other British - American units of liquid measure.

4. Given an applied problem dealing with volume or capacity, solve it.

ACTIVITIES:

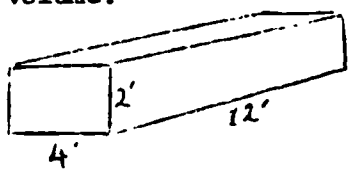
1. Study "Volume", page 309, AAMA, and do margin exercises. (Objective 1)

2. Study "Capacity", page 310, AAMA, and memorize the table of dry measure units and liquid measure units, do the margin exercises.
(Objectives 2, 3)

3. The problems on page 333 are related to these objectives and you should be able to do them. Most capacity problems can be reworded into short statements similar to the ones on page 334. For instance, if I have a one gallon can of antifreeze and I want to add $\frac{1}{5}$ of a gallon to my radiator mixture but all I've got to measure with is a one pint fruit jar, how many pints should I put in the radiator? Do you see that this translates to "$\frac{1}{5}$ gallon = $\underline{n}$ pints?" Write the odd numbered problems on page 334 as practice for these.

Criterion Test 01-10-07-01

1. Find the volume.



2. Convert.

   (a) 3 bushels = _____ pecks

   (b) 3 pecks = _____ quarts

   (c) 3 quarts = _____ pints

3. Convert.

   (a) 3 gallons = _____ quarts

   (b) 3 quarts = _____ pints

   (c) 3 pints = _____ fluid ounces

4. Solve.

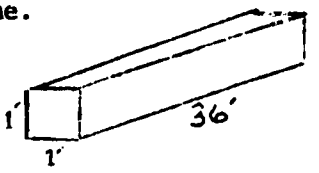
   (a) A corn bin is 15 feet wide, 30 feet long and 10 feet high. What is its volume in cubic feet?

   (b) 24 pecks of tomatoes would be how many bushels?

   (c) How many pints are there in a five gallon crock of cider?

Criterion Test 01-10-07-02

1. Find the volume.



2. Convert.

   (a) 5 bushels = _____ quarts

   (b) 5 pecks = _____ pints

   (c) 5 quarts = _____ pecks

3. Convert.

   (a) 5 gallons = _____ pints

   (b) 5 quarts = _____ fluid ounces

   (c) 5 pints = _____ gills

4. Solve.

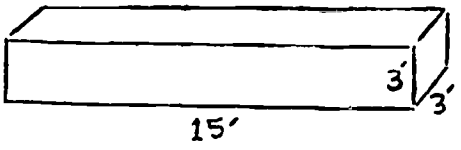
   (a) The carton for a video tape cassette player is 28 inches long, 27 inches wide, and 15 inches deep, to the nearest whole inch. What is the volume of carton to the nearest cubic inch?

   (b) If Peter Piper picked a peck of pickled peppers, how many pints of pickled peppers did Peter Piper pick?

   (c) A "fifth" contains $\frac{4}{5}$ of a quart. How many pints is that, to the nearest tenth of a pint?

Criterion Test 01-10-07-03

1. Find the volume.



2. Convert.

   (a) 1 bushel = _____ pints

   (b) 10 quarts = _____ pecks

   (c) 20 pints = _____ pecks

3. Convert.

   (a) 1 gallon = _____ fluid ounces

   (b) 10 quarts = _____ pints

   (c) 20 pints = _____ gallons

4. Solve.

   (a) A barge for lifting heavy weights from the river bottom was made of two pontoons, each 40 feet long, 10 feet wide, and five feet deep. What was the total volume of the lifting barge?

   (b) If corn were measured in quarts, how many quarts would be equal to a bushel?

   (c) How many fluid ounces are there in one gill?

Answers to Criterion Tests

Test 01-10-07-01

1. 96 $feet^3$

2. (a) 12 pecks
   (b) 24 quarts
   (c) 6 pints

3. (a) 12 quarts
   (b) 6 pints
   (c) 48 fluid ounces

4. (a) 4,500 $feet^3$
   (b) 6 bushels
   (c) 40 pints

Test 01-10-07-02

1. 36 $inches^3$

2. (a) 160 quarts
   (b) 80 pints
   (c) $\frac{5}{8}$ peck or .625 pecks

3. (a) 40 pints
   (b) 160 fluid ounces
   (c) 20 gills

4. (a) 11,340 $inches^3$
   (b) 16 pints
   (c) $\frac{8}{5}$ pints or 1.6 pints

Answers to Criterion Tests (Cont.)

Test 01-10-07-03

1. 135 feet^3

2. (a) 64 pints

   (b) $1\frac{1}{4}$ pecks or 1.25 pecks

   (c) $1\frac{1}{4}$ pecks or 1.25 pecks

3. (a) 128 fluid ounces

   (b) 20 pints

   (c) $2\frac{1}{2}$ gallons or 2.5 gallons

4. (a) 4,000 feet^3

   (b) 32 quarts

   (c) 4 fluid ounces

I. U. #01-10-08

WEIGHT, MASS, AND TIME

You will need to recall:

1. That weight is a measure of the attraction of the Earth for an object and may change somewhat with location. That mass is a measure of a body's tendancy to resist a change in velocity. At one location on the earth's surface, for instance, here in this room, mass and weight are proportional to each other. The common metric system units for weight are the dyne and newton. We will not study these units in this instructional unit. The common British - American system units for weight are the ton, pound, ounce, and grain. We will be studying these. The metric system units for mass are found in the table on page 312. You should memorize this table. All conversions shown in the textbook are correct. The only inaccuracy is that grams and units based on the gram are units of mass, not weight.

OBJECTIVES:

1. Given the weight of an object in one of the British - American weight units, convert it to any other British - American weight units.

2. Given the mass of an object in one of metric units of mass, convert it to any other metric unit of mass. (grams, kilograms, etc. are units of mass. The metric unit of weight is a newton. We will let your science teacher explain the newton to you.)

3. Given a length of time measured in one of the common units of time, convert it to any of the other common units of time.

4. Given an applied problem dealing with measurements of weight, mass, or time, solve it.

ACTIVITIES:

1. Study page 311, memorize the table, write the margin exercises. (Objective 1)

2. Study page 312, 313, wherever the word "weight" appears on these two pages, change it to "mass". Memorize the tables on pages 312, 313. Do the margin exercises. (Objective 2)

3. Study page 314, memorize the table, do the margin exercises. (Objective 3)

4. Most applied problems dealing with weight, mass, or time can be reworded into sentences similar to the ones on pages 335 and 336. For instance, a certain irrigation pump is oiled by adjusting a "drip oiler" to allow four drops to fall each minute. How many seconds should there be between drops? Do you see that this problem can be reworded to "$\frac{1}{4}$ minute = _____ seconds?" Do some of the exercise on pages 335, 336 for practice. (Objective 4)

Criterion Test 01-10-08-01

1. Convert 1.5 tons to (a) pounds
   (b) ounces

2. Convert 5.5 kilograms to (a) grams
   (b) milligrams

3. Convert 3 days to (a) hours
   (b) minutes
   (c) seconds

4. Solve.

   (a) A truckload of corn weighed 8470 pounds. How many tons is that? (To the nearest thousandth)

   (b) When one does a calculation in the MKS system (meter, kilogram, second) all masses must be expressed in kilograms. A platform balance indicates that a certain mass is 273 grams. Rename this mass in kilograms.

   (c) A light-year is the distance that light travels in one year. Light travels at approximately 186,000 miles per second. How many seconds are there in one year? ($365\ \frac{1}{4}$ days)

Criterion Test 01-10-08-02

1. Convert 525 pounds to (a) tons to the nearest ten thousandth of a ton.
   (b) ounces

2. Convert 789 grams to (a) kilograms
   (b) milligrams

3. Convert 376 hours to (a) days to the nearest thousandth of a day
   (b) minutes

4. Solve.

   (a) A bull is considered unusually heavy if he weighs over a ton. How many pounds would an unusually heavy bull weigh?

   (b) One of the measuring systems used in science is called the CGS system (centimeter, gram, second). To balance a platform balance it is necessary to place a 5 kilogram mass, a 1 kilogram mass, a 500 gram mass, and a 100 gram mass on one pan of the balance. Express the sum of these masses in the CGS system.

   (c) The school day starts at 8:30 AM and ends at 4:05 PM. With 20 minutes off for lunch, how many hours long, to the nearest hundredth of an hour, is the school day?

Criterion Test 01-10-08-03

1. Convert 395 ounces to (a) pounds to the nearest thousandth
   (b) tons to the nearest ten thousandth

2. Convert 513 kilograms to (a) grams
   (b) milligrams

3. Convert 30 days to (a) years (use 360 days for one year)
   (b) weeks to the nearest hundredth of a week

4. Solve.

   (a) A man weighs 180 pounds on Earth and $\frac{1}{6}$ as much on the moon. How many ounces does he weigh on the moon?

   (b) The mass of one cubic centimeter of water is one gram. How many cubic centimeters of water will it take to have a mass of 1 kilogram?

   (c) If your heart beats 80 times per minute, how many beats per second is this? Carry your answer out to the nearest hundredth of a heart beat.

Answers to Criterion Tests

Test 01-10-08-01

1. (a) 3000 pounds (b) 48,000 ounces
2. (a) 5,500 grams (b) 5,500,000 milligrams
3. (a) 72 hours (b) 4320 minutes
   (c) 259,200 seconds
4. (a) 4.235 tons (b) .273 kilograms
   (c) 31,557,600 seconds

Test 01-10-08-03

1. (a) .2625 tons (b) 8,400 ounces
2. (a) .789 kilograms (b) 789,000 milligrams
3. (a) 15.667 days (b) 22,560 minutes
4. (a) over 2000 pounds (b) 6,600 grams
   (c) 7.25 hours

Test 01-10-08-03

1. (a) 24.688 pounds (b) .0123 ton
2. (a) 513,000 grams (b) 513,000,000 milligrams
3. (a) $\frac{1}{12}$ year or .083 year (b) 4.29 weeks
4. (a) 480 ounces (b) 1000 cubic centimeters
   (c) 1.33 beats per second

THE END
Package 01-10