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**DIVISION OF ADULT EDUCATION**

**8121**

**Code**

**ADULT BASIC EDUCATION: BASIC MATH**

**Beginning 2015**

**Course Length**: 180 Hrs

**Course Number**: 8121

**DURATION**: A minimum of 60 hours or until the student has mastered competencies.

**GRADE LEVEL**: Non-graded Adult.

**CREDIT**: One credit per 60 hours of attendance, with a maximum of 3 credits

**PROGRAM DESCRIPTION**: This course is intended for students who need to develop proficiency in execution and application of basic whole number operations. Mastery of these skills is addressed through drill and practice exercises, accompanied by an emphasis on common, practical problem-solving applications as outlined in the mathematics content standards for adult education. These standards were adapted from California’s Common Core State Standards for Mathematics (CCSSM).

**STUDENT LEARNING OUTCOMES:**

* Students will establish personal, academic and/or workforce goals and demonstrate progress toward them
* Students will solve problems
* Students will communicate clearly and collaborate with others
* Students will use resources, including technology, to research, organize and communicate information

**Counting and Cardinality**

1.0 Students will understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted (CCS MK CC4b).

**Operations and Algebraic Thinking**

1.0 Students will fluently add and subtract. (CCS MK OA5)

2.0 Students will use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (CCS M1 OA1)

3.0 Students will solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (CCS M1 OA2)

4.0 Students will apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 =

11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + (6 + 4) = 2 + 10 = 12. (Associative property of addition.) (CCS M1 OA3)

5.0 Students will determine the unknown whole number in an addition or subtraction equation relating

three whole numbers. For example, determine the unknown number that makes the equation true in

each of the equations 8 + ? = 11, 5 = – 3, 6 + 6 = . (CCS M1 OA8)

6.0 Students will use addition and subtraction within 100 to solve one- and two-step word problems

involving situations of adding to, taking from, putting together, taking apart, and comparing, with

unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown

number to represent the problem. (CCS M2 OA1)

7.0 Students will fluently add and subtract within 20 using mental strategies. By end of Grade 2, know

from memory all sums of two one-digit numbers. (CCS M2 OA2)

8.0 Students will Determine whether a group of objects (up to 20) has an odd or even number of

members, e.g., by pairing objects or counting them by 2s; write an equation to express an even

number as a sum of two equal addends. (CCS M2 OA3)

9.0 Students will Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects

in 5 groups of 7 objects each, or 7 groups of 5 objects each. For example, describe a context in which a

total number of objects can be expressed as 5 × 7. (CCS M3 OA1)

10.0 Students will interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the

number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56÷8. (CCS M3 OA2)

11.0 Students will use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (CCS M3 OA3)

12.0 Students will determine the unknown whole number in a multiplication or division equation

relating three whole numbers. For example, determine the unknown number that makes the

equation true in each of the equations. (CCS M3 OA4)

13.0 Students will apply properties of operations as strategies to multiply and divide.2 Examples: If 6 × 4

= 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2

can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative

property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2)

= (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property). (CCS M3 OA5)

14.0 Students will understand division as an unknown-factor problem. For example, find 32 ÷ 8 by

finding the number that makes 32 when multiplied by 8. (CCS M3 OA6)

15.0 Students will fluently multiply and divide within 100, using strategies such as the relationship

between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or

properties of operations. By the end of Grade 3, know from memory all products of two one-digit

numbers. (CCS M3 OA7)

16.0 Students will solve two-step word problems using the four operations. Represent these problems

using equations with a letter standing for the unknown quantity. Assess the reasonableness of

answers using mental computation and estimation strategies including rounding. (CCS M3 OA8)

**Number and Operations in Base Ten**

1.0 Students will compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. (CCS M1 NBT3)

2.0 Students will understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. (CCS M2 NBT1)

3.0 Students will use place value understanding to round whole numbers to the nearest 10 or 100.

(CCS M3 NBT1)

4.0 Students will understand that the four digits of a four-digit number represent amounts of thousands,

hundreds, tens, and ones; e.g. 3,706 = 3000 + 700 + 6 = 3 thousands, 7 hundreds, 0 tens, and 6 ones.

(CCS M3 NBT1.1)

5.0 Students will fluently add and subtract within 1000 using strategies and algorithms based on place

value, properties of operations, and/or the relationship between addition and subtraction. (CCS M3

NBT2)

6.0 Students will multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5

× 60) using strategies based on place value and properties of operations. (CCS M3 NBT3)

7.0 Students will fluently add and subtract within 100 using strategies based on place value, properties

of operations, and/or the relationship between addition and subtraction. (CCS M2 NBT5)

8.0 Students will add and subtract within 1000, using concrete models or drawings and strategies based

on place value, properties of operations, and/or the relationship between addition and subtraction;

relate the strategy to a written method. Understand that in adding or subtracting three-digit

numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and

sometimes it is necessary to compose or decompose tens or hundreds. (CCS M2 NBT7)

9.0 Students will use estimation strategies in computation and problem solving with numbers up to

1000. (CCS M2 NBT7.1)

10.0 Students will mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100

from a given number 100–900. (CCS M2 NBT8)

**Number and Operations-Fractions**

1.0 Students will understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned

into equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. (CCS M3 NF1)

2.0 Students will understand a fraction as a number on the number line; represent fractions on a

number line diagram. (CCS M3 NF2)

3.0 Students will represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1

as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. (CCS M3 NF2.a)

4.0 Students will represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0.

Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. (CCS M3 NF2.b)

5.0 Students will explain equivalence of fractions in special cases, and compare fractions by reasoning

about their size. (CCS M3 NF3)

6.0 Students will understand two fractions as equivalent (equal) if they are the same size, or the same

point on a number line. Recognize that equivalencies are only valid when the two fractions refer to the same whole. (CCS M3 NF3.a)

7.0 Students will recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain

why the fractions are equivalent, e.g., by using a visual fraction model. (CCS M3 NF3.b)

8.0 Students will express whole numbers as fractions, and recognize fractions that are equivalent to

whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. (MSG 3.NF.3.c)

9.0 Students will compare two fractions with the same numerator or the same denominator by reasoning

about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. (CCS M3 NF3.d)

10.0 Students will know and understand that 25 cents is 1⁄4 of a dollar, 50 cents is 1⁄2 of a dollar, and

75 cents is 3⁄4 of a dollar. (CCS M3 NF3.e)

**Measurements and Data**

11.0 Students will describe measurable attributes of objects, such as length or weight. Describe several

measurable attributes of a single object. (CCS MK MD1)

12.0 Students will draw a picture graph and a bar graph (with single-unit scale) to represent a data set

with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (CCS M2 MD10)

13.0 Students will tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. (CCS M3 MD1)

14.0 Students will measure and estimate liquid volumes and masses of objects using standard units of

grams (g), kilograms (kg), and English Units (oz., lb.), and liters (l).6 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (CCS M3 MD2)

15.0 Students will generate measurement data by measuring lengths using rulers marked with halves

and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. (CCS M3 MD4)

16.0 Students will recognize area as an attribute of plane figures and understand concepts of area

measurement. (CCS M3 MD5)

17.0 Students will measure areas by counting unit squares (square cm, square m, square in, square ft.,

and improvised units). (CCS M3 MD6)

18.0 Students will relate area to the operations of multiplication and addition. (CCS M3 MD7)

19.0 Students will solve real world and mathematical problems involving perimeters of polygons,

including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. (CCS M3 MD8)

20.0 Students will measure the length of an object by selecting and using appropriate tools such as

rulers, yardsticks, meter sticks, and measuring tapes. (CCS M2 MD1)

21.0 Students will estimate lengths using units of inches, feet, centimeters, and meters. (CCS M2 MD3)

22.0 Students will measure to determine how much longer one object is than another, expressing the

length difference in terms of a standard length unit. (CCS M2 MD4)

23.0 Students will tell and write time from analog and digital clocks to the nearest five minutes, using

a.m. and p.m. Know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). (CCS M2 MD7)

**Geometry**

1.0 Students correctly name shapes regardless of their orientations or overall size. (CCS MK G2)

2.0 Students will recognize and draw shapes having specified attributes, such as a given number of

angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. (CCS M2 G1)

3.0 Students will partition circles and rectangles into two, three, or four equal shares, describe the shares

using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. (CCS M2 G3)

4.0 Students will understand that shapes in different categories (e.g., rhombuses, rectangles, and others)

may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. (CCS M3 G1)

5.0 Students will partition shapes into parts with equal areas. Express the area of each part as a unit

fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape. (CCS M3 G2)

**Instructional Strategies and Times:**

1. Teacher lectures, explanations, and demonstration 20%

2. Individual or group applications of mathematical skills to text and exercises 50%

3. Class discussion of mathematical principles and skills (in individualized instruction

teacher/student conferences and direct tutoring) 20%

4. Testing 10%

**Evaluation**:

Student evaluation will be based upon:

1. Satisfactory completion of written assignments as evaluated by the instructor.

2. Satisfactory completion of teacher-made and/or standardized examinations.

3. Satisfactory progress and participation in classroom activities as evaluated by the instructor.

**Conditions for Repetition:**

There are no conditions for repeating this course.

Approved:

BOARD OF TRUSTEES

July 15, 2013

October 26, 2015