

Illinois Community College Board
Adult Education & Literacy

**Illinois ABE/ASE
Mathematics
Model Curriculum
NRS Level 1**

April 2017
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Acknowledgements

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NRS Level 1 Math

Beginning ABE Literacy (Grade Levels 0-1.9)

COUNTING AND CARDINALITY / NUMERACY (CC)

1.CC.1 / 1.CC.2 / 1.CC.3 / 1.CC.4 / 1.CC.5 / 1.CC.6 / 1.CC.7

Essential Understandings:

- Counting determines how many or how much a quantity/number represents.
- When counting, the last number spoken is the total number of objects.
- Counting one more will be the next larger number.
- Each successive number name refers to a quantity that is one larger.
- Knowledge of numbers 0-10 can be applied to predict order and sequence in higher numbers (10-20, 20-30, etc.)
- Quantities of numbers can be compared, ordered, and described as less than, greater than, or equal to one another.
- A written number represents an amount/quantity/order and each number represents a different amount/quantity/order.

Essential Questions:

- Why/when are objects counted? What objects are/can be counted?
- How is number order helpful to us?
- What can numerals represent?
- How would you describe a teen number?
- How can you use 0-10 to predict other counting sequences?

Student will be able to:

(what does mastery look like)

- Count to 100 by ones and tens.
- Count numbers forward from any given number within a learned sequence.
- Write numerals 0-20 and represent a corresponding quantity.
- Use one-to-one correspondence when counting, count numbers in sequence.
- Count objects and know the last number said is the total number of objects counted.
- Name number of objects in a set regardless of position or the order of object count.
- Count and associate each successive number name with a corresponding quantity that is one larger.
- Count up to 20 objects in an orderly arrangement and up to 10 objects in a scattered arrangement.
- Compare and contrast the number of objects within a group of ten by using the phrases “*greater than*,” “*less than*,” and “*equal to*.”
- Compare written numerals between 1 and 10 represented by given written numerals.

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Evidence for Assessing Learning

Performance Tasks:

Demonstrate mastery of objectives through the assessment of graded homework, worksheets, quantitative (numerically graded) rubrics, quizzes, tests, and other formal assessments. Including but not limited to:

- Create a graphic representation of level appropriate quantities and assess with rubric
- Teacher observation with rubric of students using math manipulatives to demonstrate level appropriate quantity and symbol connections
- TPR/command cards task performance with rubric
- Teacher observation of small group conversations (e.g., discussing/describe what is a teen number) and projects (applying concept of teen numbers kinesthetically, orally, through audio or visually) using rubric
- Formal teacher observation with rubric

Other Evidence:

- Informal teacher observation
- Exit tickets
- Monitoring group work and student discussions
- Student self-assessment
- Student portfolio
- Math journal

Building the Learning Plan

Sample Classroom Activities and/or Lesson Plans:

- Coins/Bills for counting by ones and tens (either the unit is by cents OR dollars to avoid decimal numbers)
- Comparing prices on tags (by cents OR dollars to avoid decimal numbers)
- Counting page numbers read in book either from 1 or from first page read
- Counting items/people/places
- Telling which address falls in a block knowing the house number
- Math U See or other manipulative base ten materials for ones, tens and hundreds
- Color-coded cards (ones, tens, hundred) for associating symbol with quantity
- Manipulative bead chains for counting by ones and tens and ticketing with numeric labels by ones and tens
- Textbooks (Contemporary/McGraw Hill) – exercises as assigned
 - *Number Sense: Whole Numbers, Addition & Subtraction*
 - *TABE Fundamentals Mathematics Workbook, Level E*

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- Word problem cards with/without authentic materials for solving real life problems and simulations such as the following:
 - Counting dimes, \$10 bills
 - Counting page numbers read
 - Counting items in a group
 - Counting coins to pay for a purchase
 - Telling which address falls in a given block, knowing the first number on the block
 - Counting the number of loose coins in a pile
 - Separating loose coins into like piles and counting the number in each
 - Comparing price tags on two items

Learning Activities:

(interventions for students who are not progressing, instructional strategies, differentiated instruction, re-teaching options)

- One-to-one tutors
- Pair up for peer-teaching
- Universal Design for Learning: this is not an activity itself, but all activities can be designed for broader or “universal” access. The 3 components of UDL include:
 - Multiple representations of information such as text and numbers read aloud by a computer, captions on video, text accompanying audio, verbal descriptions of pictures, drawings and models, and using video, animation or other educational technology to convey concepts.
 - Multiple representations of expression such as students being able to record oral speech (to text or not), drawing, dramatic presentations, songs/raps.
 - Varied options of engagement enabling students as well as teachers to select for or reframe elements of content/context/procedures, challenge level, and supports including modifications and accommodations such as additional time, enlarged print, text-to-speech apps, bilingual dictionary, etc.
- Interactive technologies assigned by instructor to support instruction for the purpose of additional and varied practice opportunities on targeted skills.

List of Instructional Materials:

- Coins/Bills (play money or real)
- Counters (discs, beans, buttons, etc.)
- Base Ten manipulatives (Math U See)
- Manipulative bead chains (tens up to hundred)
- Manipulative teens beads (ten bars and unit beads) and boards with numeral tiles
- Manipulative tens beads and boards with numeral tiles

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- Manipulative Hundreds Board
- Manipulative Number Rods (1-10) with numeral cards
- Manipulative spindle box (presents concept of zero along with counting reinforcement)
- Word problem cards with/without authentic materials for solving real life problems and simulations.
- *Number Sense: Whole Numbers, Addition & Subtraction, 2nd ed.* (2003). McGraw Hill Education.
- *TABE Fundamentals Mathematics Workbook, Level E.* (2010). McGraw Hill Education.

List of Technology Resources:

- Kahn Academy – <http://khanacademy.org/>
- Greg Tang Math—www.gregtangmath.com
- CK-12 - <https://flexbooks.ck12.org/pages/adult-education/#adult-basic-education>

OPERATIONS AND ALGEBRAIC THINKING (OA)

1.OA.1 / 1.OA.2 / 1.OA.3 / 1.OA.4 / 1.OA.5 / 1.OA.6 / 1.OA.7 / 1.OA.8 / 1.OA.9 /
1.OA.10 / 1.OA.11 / 1.OA.12 / 1.OA.13

Essential Understandings:

- Addition and subtraction can be represented by objects, drawings, manipulatives, and other modalities.
- Expressions and equations can be used to decompose numbers in more than one way.
- Quantities can be used to create a variety of individual groupings.
- Numbers less than or equal to 20 can be decomposed by adding, subtracting, or re-grouping.
- The whole is equal to the sum of its parts; conversely, the whole minus a part is equal to the other part.
- Strategies (for example, properties of addition) can be used to decompose complex problems to make an easier problem (counting on, make a ten, near ten, doubles, plus one, plus two, etc.)
- Problem solving structures reinforce part/whole and number combinations within 20
- Word problems have basic problem solving structures: adding to, taking from, putting together, taking apart, comparing and can be represented using different modalities.
- Unknowns can be in various locations (start, change, result) in equations and develop from combinations of numbers.
- Addition and subtraction are related/inverse operations.
- Various strategies can be used to quickly add numbers.
- The equal sign is used to represent quantities that have the same value.

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Essential Questions:

- Why should numbers be decomposed to form different combinations of a specific number?
- What is the connection of a number to an equation or expression?
- How are word problems connected to an equation or expression?
- Why is it important to know multiple strategies in solving addition/subtraction problems?
- How are problem solving strategies and/or properties connected to number relationships?
- What is the relationship between addition and subtraction?
- How can word problems be decoded into equations or expressions to solve them?
- Does a solution make the equation true or false? How is a solution evaluated and does it make sense?

Student will be able to:

(what does mastery look like)

- Represent addition and subtraction through multiple modalities (e.g., manipulatives, actions, drawings).
- Add and subtract within 10 and solve word problems using objects or drawings.
- Represent addition and subtraction as taking apart and putting together pairs of numbers equal to or less than 10 in multiple ways (e.g., using objects such as counters), and draw or write the corresponding equations.
- Starting from any number from 1 to 9, find the unknown number that makes 10 when added to the starting number (e.g., by using objects or drawings), and draw or write the resulting equation.
- Fluently add and subtract within 5.
- Solve addition and subtraction word problems within 20 involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in the start, change and results positions. Use objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- Solve addition word problems using three whole numbers whose sum is less than or equal to 20 using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- Add and subtract by applying the commutative and associative properties of operations, though students need not use formal terms for these properties.
- Subtract within 20 using the relationship between subtraction and addition by solving for the unknown addend (e.g., Solve “ $10 - 8 = ?$ ” by finding “ $8 + ? = 10$ ”).
- Use “counting on” strategy to add and subtract.
- Add and subtract within 20 (fluently within 10), using multiple strategies such as counting on, making 10, decomposing numbers leading to 10 using associative

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property, using relationships between addition and subtraction, and using equivalent/known sums for problem solving.

- Read equations, understanding the function of the equal sign, and determine if an equation is true or false (e.g., Which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$).
- Solve for the unknown whole number in all positions (start, change, result) in an addition or subtraction equation (e.g., Solve for $8 + ? = 11$, $5 = ? - 3$, $6 + 6 = ?$).

Evidence for Assessing Learning

Performance Tasks:

Demonstrate mastery of objectives through the assessment of graded homework, worksheets, quantitative (numerically graded) rubrics, quizzes, tests, and other formal assessments. Including but not limited to:

- Teacher observation with rubric of student work using manipulatives
- Teacher observation with rubric of group work, discussions on solving for word problems.
- Student creation of and solving for level-appropriate word problems in meaningful contexts (assessed with rubric)

Other Evidence:

- Informal teacher observation
- Exit tickets
- Monitoring group work and student discussions
- Student self-assessment
- Student portfolio
- Student journal

Building the Learning Plan

Sample Classroom Activities and/or Lesson Plans:

- Menus (adapted for coins OR bills to avoid decimal numbers)
- Count change from bill up to \$20.
- Digital clock for counting time.
- Meaningful authentic materials (ex: shopping list items to determine amount needed for recipe)
- Manipulative number rods and short bead stairs (1-9) to show composing/decomposing of numbers to 10.
- Addition board and subtraction grid/board (to establish systematic way for learning addition/subtraction tables)
- Addition chart and subtraction chart (to aid in memorizing addition and subtraction tables)

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- Manipulative bead “snake” game (to reiterate need to return each time to the 1-10 sequence in counting as well as prep for learning addition/subtraction tables)
- Word problem cards with/without authentic materials for solving real life problems and simulations such as the following:
 - figuring the number of hours of work or sleep by using fingers to count
 - counting money and making change
 - using manipulatives to establish number relationships
 - working out the shortfall in numbers (e.g., eggs for a recipe, plants to fill a display tray, cups to serve visitors)
 - finding the total price of 3 items ordered from a menu
 - placing same number of cookies on different shaped trays
 - figuring change to receive from a \$10 bill
 - watching a digital clock count down the time
 - paying a \$12 charge with a \$10 bill and two \$1 bills
 - test taking when seeking employment
 - helping children with homework

Learning Activities:

(interventions for students who are not progressing, instructional strategies, differentiated instruction, re-teaching options)

- One-to-one tutors
- Pair up for peer-teaching
- Universal Design for Learning: this is not an activity itself, but all activities can be designed for broader or “universal” access. The 3 components of UDL include:
 - Multiple representations of information such as text and numbers read aloud by a computer, captions on video, text accompanying audio, verbal descriptions of pictures, drawings and models, and using video, animation or other educational technology to convey concepts.
 - Multiple representations of expression such as students being able to record oral speech (to text or not), drawing, dramatic presentations, songs/raps.
 - Varied options of engagement enabling students as well as teachers to select for or reframe elements of content/context/procedures, challenge level, and supports including modifications and accommodations such as additional time, enlarged print, text-to-speech apps, bilingual dictionary, etc.
- Interactive technologies assigned by instructor to support instruction such as for the purpose of additional and varied practice opportunities on targeted skills. As an intervention, see UDL explanation above.

List of Instructional Materials:

- Manipulative number rods
- Manipulative short bead stairs (1-9)
- Manipulative addition/subtraction boards with strips

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- Manipulative addition/subtraction charts with tables, booklets, etc. as well as control charts
- Manipulative addition and subtraction “snake” games
- Simplified menus
- Coins/Bills
- Digital clocks
- Word problem cards with/without authentic materials for solving real life problems and simulations.

List of Technology Resources:

- Khan Academy—<http://khanacademy.org/>
- Greg Tang Math—www.gregtangmath.com
- Ck-12- <https://flexbooks.ck12.org/pages/adult-education/#adult-basic-education>

NUMBER AND OPERATIONS IN BASE TEN (NBT)

1.NBT.1 / 1.NBT.2 / 1.NBT.3 / 1.NBT.4 / 1.NBT.5 / 1.NBT.6

Essential Understandings:

- Two digit numbers are composed of groups of tens and ones and can be compared with symbols (<, >, =) in terms of their relationship.
- Various models can be used to build individual numbers with tens/ones while counting.
- Counting sequences can be used to understand counting by 10s, identifying 10 more, 10 less.
- Counting can be connected to adding and subtracting.
- Addition can be used to solve and/or evaluate subtraction and vice versa.
- Mental math can be used to check and/or perform calculations in base 10.

Essential Questions:

- How do addition and subtraction relate to counting sequences?
- How does understanding properties of operations help with strategies when performing written and mental calculations?
- How does using objects and drawings help represent problems in multiple ways?
- What is significant about 10?
- What is significant about the teen numbers and how do these numbers relate to 10? (e.g., $10 + 3 = 13$).

Student will be able to:

(what does mastery look like)

- When given a set of objects (ranging from 0-120), read, write, and represent any quantity with a written numeral, and count to 120 starting at any number less than 120.

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- Explain the value of each digit in a two-digit number by identifying a bundle of 10 ones as a “ten,” representing a two-digit numeral using “tens” and “ones,” and representing a two-digit numeral ending in 0 (ranging from 10-90) using “tens” and 0 “ones.”
- Demonstrate understanding of tens and ones digits by comparing two two-digit numbers with comparison words *greater than*, *less than*, and *equal to*.
- Build and decompose numbers into tens and ones (including adding a two-digit and one-digit number and adding a two-digit number and a multiple of 10), relate the chosen strategy (e.g., concrete models, drawings, or place value understanding) for the operation to a written method, and explain the reasoning used.
- Mentally add ten and take away ten to a given two-digit number, and explain the process of doing so.
- Subtract multiples of 10 from decade numbers within 100, relate the chosen strategy (e.g., concrete models, drawings, or place value understanding) for the operation to a written method, and explain the reasoning used.

Evidence for Assessing Learning

Performance Tasks:

Demonstrate mastery of objectives through the assessment of graded homework, worksheets, quantitative (numerically graded) rubrics, quizzes, tests, and other formal assessments. Including but not limited to:

- Teacher observation of student work with manipulatives, using rubric
- Teacher observation of group work and discussions, using rubric.
- Creating/solving level-appropriate word problems in meaningful contexts, assessed with rubric

Other Evidence:

- Informal teacher observation
- Exit tickets
- Monitoring group work and student discussions
- Student self-assessment
- Student portfolio
- Student journal

Building the Learning Plan

Sample Classroom Activities and/or Lesson Plans:

- Checking account deposits (fill out or interpret).
- Count money to make change.
- Count pages read in book.

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- Use manipulative short bead stairs (1-9) and Math U See Base Ten ones/tens beads with Seguin boards and number cards to show place value for teens and tens.
- Use base ten beads of ones/tens/hundred to add/subtract quantities and to show how ones can be composed into tens and applied to addition.
- Use color-coded and sized numeral cards to show how written numbers can be composed/decomposed according to place value.
- Word problem cards with/without authentic materials for solving real life problems and simulations such as the following:
 - counting page numbers read at one time, starting from first page read
 - using mental math to check that correct change was received
 - telling which address falls in a block, knowing the house number
 - calculating the production shortfall from a daily target
 - performing mental addition
 - verifying deposits in a checking account
 - counting money and making change
 - changing radio stations

Learning Activities:

(interventions for students who are not progressing, instructional strategies, differentiated instruction, re-teaching options)

- One-on-one tutors
- Pair up for peer-teaching
- Universal Design for Learning: this is not an activity itself, but all activities can be designed for broader or “universal” access. The 3 components of UDL include:
 - Multiple representations of information such as text and numbers read aloud by a computer, captions on video, text accompanying audio, verbal descriptions of pictures, drawings and models, and using video, animation or other educational technology to convey concepts.
 - Multiple representations of expression such as students being able to record oral speech (to text or not), drawing, dramatic presentations, songs/raps.
 - Varied options of engagement enabling students as well as teachers to select for or reframe elements of content/context/procedures, challenge level, and supports including modifications and accommodations such as additional time, enlarged print, text-to-speech apps, bilingual dictionary, etc.
 - Interactive technologies assigned by instructor to support instruction for the purpose of additional and varied practice opportunities on targeted skills.

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List of Instructional Materials:

- Color-coded and sized number cards according to place value
- Manipulative Base Ten materials for showing ones/tens values
- Play money
- Checking/savings account deposit slips/ledger
- Word problem cards with/without authentic materials for solving real life problems and simulations.

List of Technology Resources:

- Khan Academy—<http://khanacademy.org/>
- Greg Tang Math—www.gregtangmath.com
- Ck-12- <https://flexbooks.ck12.org/pages/adult-education/#adult-basic-education>

MEASUREMENT AND DATA (MD)

1.MD.1/ 1.MD.2 / 1.MD.3 / 1.MD.4 / 1.MD.5 / 1.MD.6 / 1.MD.7

Essential Understandings:

- Some attributes are measurable; both numbers and words can be used to describe and compare the measurements.
- Objects can be classified, ordered, and compared by attributes and/or measurement.
- Time is measured in hours and half-hours using analog and digital clocks.
- Data can be organized and classified by comparing attributes (height, width and depth).

Essential Questions:

- How are measurable attributes determined and why are these attributes of objects important to comparing quantities?
- How are dividing a circle and telling time related?
- What is the purpose of categorizing data?
- What strategies can be used to organize data?

Student will be able to:

(what does mastery look like)

- Use words to describe several measurable attributes of an object such as length or weight.
- Measure and compare two objects regarding their measurable attributes (e.g., *taller than, shorter than, heavier than, lighter than*).
- Sort items by classification into given categories (e.g., size, color, type), count the items per category, and sort the categories by count.

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- Order three objects according to length and compare two lengths based on the third.
- Select an object as a “length unit” to measure lengths of larger objects (e.g., “The table is 5 dowel rods long.”), lay the selected length units end to end with no gaps between, and count and name the length of the larger object as a whole number unit measure.
- Identify the time by hours and half hours, verbally and in writing, using analog and digital clocks.
- Organize data with up to three categories in various ways, and ask and answer quantity and comparison questions about the categories of data.

Evidence for Assessing Learning

Performance Tasks:

Demonstrate mastery of objectives through the assessment of graded homework, worksheets, quantitative (numerically graded) rubrics, quizzes, tests, and other formal assessments. Including but not limited to:

- Teacher observation of student work with manipulatives, using rubric
- Teacher observation of group work and discussions, using rubric.
- Creating/solving level-appropriate word problems in meaningful contexts, assessed with rubric
- Project-based learning with rubric assessment

Other Evidence:

- Informal teacher observation
- Exit tickets
- Monitoring group work and student discussions
- Student self-assessment
- Student portfolio
- Student journal

Building the Learning Plan

Sample Classroom Activities and/or Lesson Plans:

Materials for classroom demonstrations and instructor directed exercises:

- Use manipulative length rods, width rods and stacking tower to present concept of varied measurable attributes
- Cuisenaire rods (length units for measuring other Cuisenaire rods or other objects)-For teacher demonstration/student manipulative.
- Meaningful, authentic materials from daily life (aka “realia”) and images for classification and/or measurement of length, weight, etc.

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- Analog and digital clocks to measure time.
- Flash cards for matching analog time to digital time according to hour/half hour units of time.
- Analog clock stamp for writing in hands for hours/half hours.
- A “judy” clock with gears to move hands in response to oral prompt or use of clock as prompt for written work.
- Word problem cards with/without authentic materials for solving real life problems and simulations such as the following:
 - describing a rectangular photo or frame
 - describing seasons, daylight savings time or tides
 - sorting laundry or bottles for the recycling facility
 - understanding a child’s growth chart
 - reading a bus schedule

Learning Activities:

(interventions for students who are not progressing, instructional strategies, differentiated instruction, re-teaching options)

- One-on-one tutors
- Pair up for peer-teaching
- Universal Design for Learning: this is not an activity itself, but all activities can be designed for broader or “universal” access. The 3 components of UDL include:
 - Multiple representations of information such as text and numbers read aloud by a computer, captions on video, text accompanying audio, verbal descriptions of pictures, drawings and models, and using video, animation or other educational technology to convey concepts.
 - Multiple representations of expression such as students being able to record oral speech (to text or not), drawing, dramatic presentations, songs/raps.
 - Varied options of engagement enabling students as well as teachers to select for or reframe elements of content/context/procedures, challenge level, and supports including modifications and accommodations such as additional time, enlarged print, text-to-speech apps, bilingual dictionary, etc.
- Interactive technologies assigned by instructor to support instruction for the purpose of additional and varied practice opportunities on targeted skills.

List of Instructional Materials:

- Manipulative red length rods
- Manipulative brown stairs
- Manipulative pink tower
- Cuisenaire rods
- Meaningful authentic materials from daily life (aka “realia”) and images for classifying and/or measuring
- Analog and digital clocks.

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- “Judy” clock with gears (or Jude e-clock at www.mrmyers.org)
- Flash cards for matching analog time to digital time according to hour/half hour units of time.
- Analog clock stamp and pad
- A bus schedule
- Child’s growth chart (length/weight)
- Word problem cards with/without authentic materials for solving real life problems and simulations

List of Technology Resources:

- Khan Academy—<http://khanacademy.org/>
- Greg Tang Math—www.gregtangmath.com
- CK-12 <https://flexbooks.ck12.org/pages/adult-education/#adult-basic-education>

GEOMETRY (G)

1.G.1 / 1.G.2 / 1.G.3 / 1.G.4 / 1.G.5 / 1.G.6 / 1.G.7 / 1.G.8 / 1.G.9

Essential Understandings:

- Objects have position relative to other objects using terms such as “above,” “below,” “beside,” “in front of,” “behind,” and “next to.”
- Two-dimensional shapes are flat and can be built from components.
- Three-dimensional shapes have unique attributes and specific names regardless of their orientations or overall size.
- Attributes are used to compare and analyze two- and three-dimensional shapes.
- Circles and rectangles can be used to create more complex shapes; circles and rectangles can be partitioned into equal shares.
- Shapes can be used to build pictures, designs and other shapes.
- Understanding of shapes and components to recognize and represent shapes in the world.

Essential Questions:

- Why are positional words important in math?
- How can shapes be partitioned into halves and quarters?
- Why is mathematical language critical when describing two-dimensional and three-dimensional shapes?
- How can two-dimensional shapes be decomposed or combined to form two- or three-dimensional shapes and vice versa?

Student will be able to:

(what does mastery look like)

- Name and describe shapes in the environment, and state the positions of shapes in the environment using prepositions of location.

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- Name shapes regardless of size or orientation.
- Distinguish between planes (two-dimensional shapes) and solids (three-dimensional shapes).
- Analyze and compare planes and solids using informal terms (e.g., counting number of sides and vertices, identifying sides of equal length vs. differing lengths) using informal language.
- Model shapes using shape components or through drawing.
- Create larger shapes from simple shape components (e.g., triangles combined to make rectangles or hexagons).
- Distinguish which attributes of a shape are defining compared to attributes that are non-defining by using models or pictures, and build and draw shapes based on defining attributes.
- Build two- and three-dimensional composite shapes from other shapes.
- Divide circles and rectangles into two and four equal parts using the words halves, fourths, and quarters to describe them, put the pieces back together to make a whole and describe this whole as 2 halves or 4 fourths, and identify that more equal shares lead to smaller shares.

Evidence for Assessing Learning

Performance Tasks:

Demonstrate mastery of objectives through the assessment of graded homework, worksheets, quantitative (numerically graded) rubrics, quizzes, tests, and other formal assessments. Including but not limited to:

- Teacher observation with rubric of student work using geometry manipulatives to create/solve problems
- Teacher observation with rubric of group work and project-based learning.
- Teacher formal assessment of student creation of and/or solving for level-appropriate word problems in meaningful contexts

Other Evidence:

- Informal teacher observation
- Exit tickets
- Monitoring group work and student discussions
- Student self-assessment
- Student portfolio
- Student journal

Building the Learning Plan

Sample Classroom Activities and/or Lesson Plans:

Materials for classroom demonstrations and instructor directed exercises:

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- Manipulative geometry cabinet and solids to name, describe, and distinguish two- and three dimensional shapes.
- Manipulative geometry three-part classification cards (picture card, name card, control card with picture and name).
- “I spy” game for shapes in environment using prepositions of location.
- Manipulative geometry sticks to model plane shapes.
- Manipulative constructive triangles to compose larger shapes from triangles.
- Clay, origami, drinking straws, toothpicks or wooden blocks for sculpting shapes and form those shapes into composite shapes. These materials also useful for building a three-dimensional shape from two-dimensional shapes.
- Project learning by building furniture.
- Using shapes to build dioramas or scale models
- Manipulative fraction circles and equivalence material to grasp concept of two or four equal shares are halves and fourths.
- Word problem cards with/without authentic materials for solving real life problems and simulations using the following:
 - recognizing the shape and meaning of a triangular yield sign and other shapes in buildings and everyday structures
 - identifying things by shape
 - building a 3D model from flat (plane) materials
 - using a “rules of the road” book to describe shapes of road signs
 - using shapes to replicate campus map and roadways
 - checking for quality control
 - building furniture
 - cutting pizza, cake, and brownies

Learning Activities:

(interventions for students who are not progressing, instructional strategies, differentiated instruction, re-teaching options)

- One-to-one tutors
- Pair up for peer-teaching
- Universal Design for Learning: this is not an activity itself, but all activities can be designed for broader or “universal” access. The 3 components of UDL include:
 - Multiple representations of information such as text and numbers read aloud by a computer, captions on video, text accompanying audio, verbal descriptions of pictures, drawings and models, and using video, animation or other educational technology to convey concepts.
 - Multiple representations of expression such as students being able to record oral speech (to text or not), drawing, dramatic presentations, songs/raps.
 - Varied options of engagement enabling students as well as teachers to select for or reframe elements of content/context/procedures, challenge level, and supports including modifications and accommodations such as

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additional time, enlarged print, text-to-speech apps, bilingual dictionary, etc.

- Interactive technologies assigned by instructor to support instruction for the purpose of additional and varied practice opportunities on targeted skills.

List of Instructional Materials:

- Manipulative Geometry Shapes Cabinet
- Manipulative Solid Geometry Shapes
- Manipulative Geometry Classification cards (picture/name/control of error or picture/definition/control of error)
- Manipulative Geometry Sticks
- Manipulative Constructive Triangle material
- Manipulative Fraction Circle material and Geometric Fraction Equivalence Material
- Pizza/brownies/cake in round and square pans
- Clay, origami, drinking straws, toothpicks, wooden blocks
- Word problem cards with/without authentic materials for solving real life problems and simulations using shapes two- and three-dimensional found in the classroom/real world environment

List of Technology Resources:

- Khan Academy—<http://khanacademy.org/>
- Greg Tang Math—www.gregtangmath.com
- CK-12- <https://flexbooks.ck12.org/pages/adult-education/#adult-basic-education>