



Movement in Math

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This curriculum unit is recommended for:
First Grade Math/ Elementary

Keywords: *common core, movement, physical fitness, first grade, brain, poverty, sports, math, kinesthetic learner, manipulative, newsletters, economically disadvantaged, Project L.I.F.T., engagement, operation and algebraic thinking, number and operations in base ten, measurement and data, geometry, on grade level activities, remedial activities, enrichment activities*

Teaching Standards: See [Appendix 1](#) for teaching standards addressed in this unit.

Synopsis: This curriculum unit will take the four common core domains for first grade math of operation and algebraic thinking, number and operations in base ten, measurement and data and finally geometry and provided four movement activities for each. The four movement activities under each common core domain will contain two learning goal movement activities, which are on grade level, one remedial movement activity and one -enrichment activity. This unit will provide movement activities that can be done in the classroom and outside the classroom setting and environment. This unit will include activities and action games that are cooperative in nature as well as activities that can be done individually by the student. This unit is designed to teach students various activities that they can share at home to help parents see and understand their learning. In order to do this, the unit contains sample newsletters to parents that will include an explanation of how to participate in the movement activities that reinforce the math skills and provide additional practice in the home.

I plan to teach this unit during the coming 2014-2015, school year. This curriculum unit will be shared and available to all the first grade teachers at my school.

I give permission for the Institute to publish my curriculum unit and synopsis in print and online. I understand that I will be credited as the author of my work.

Movement in Math: Helping out the Brain

Cassandra Black

Introduction

I intend for this unit to contain physical fitness and movement activities that improve the academic performance for my students in math whom are first graders. Students love to move and learn through movement. Movement activities in math can help students retain information and develop more complex mathematical concepts. In order to increase student understanding and confidence in mathematics, this unit will explore current researched-based movement activities that increase active classroom engagement.

This unit has two goals. The first is to engage students in physical activity through sports and the second goal is to teach and reinforce first grade math Common Core objectives. Movement based learning activities in math can spark and maintain student interest in math concepts.

Movement in math provides a multisensory approach to teaching math. This approach can be motivate and engage students. It allows students to be more focused and see the “fun” in math. Movement activities can stimulate brain activity and increase one’s cognitive activities. Motivation can many times be a major factor in a student’s inability to learn a math concept. Movement within a math lessons can increase buy-in from the student, which could also increase a student’s participation in math class activities and lessons. Movement activities give the teacher and the student an alternative to worksheets.

Many primary learners are kinesthetic learners who learn best through hands-on movement activities. By increasing the use of manipulative and movement in the math classroom, educators can increase learning opportunities for students, especially students of poverty like those represented in my school. Movement in the math classroom can enrich the Common Core math curriculum and promote cooperation among students. Movement in the math classroom can enhance math skills, promote active lifestyles and increase a student’s ability to communicate what they are learning in math class to other students, their teacher and their parents. Incorporating movement activities in math instruction can offer success and enhance learning beyond the classroom setting by expanding learning opportunities outside the walls of the classroom and even outside the school building.

This curriculum unit will take the four Common Core domains for first grade math of operation and algebraic thinking, number and operations in base ten, measurement and data and finally geometry and provided four movement activities for

each. The four movement activities under each Common Core domain will contain two learning goal movement activities, which are on grade level, one remedial movement activity and one enrichment activity.

This unit will provide movement activities that can be done in the classroom and outside the classroom setting and environment. This unit will include activities and action games that are cooperative in nature as well as activities that can be done individually by the student. This unit will be designed to teach students various activities that they can share at home to help parents see and understand their learning. In order to do this, the unit will have sample newsletters to parents that will include an explanation of how to participate in the movement activities that reinforce the math skills and provide additional practice in the home. The NC Health and Wellness Trust Fund Commission recommends requiring 30 minutes of daily physical active for each child in elementary and middle school. First graders need about 60 minutes of physical activity a day and adults need around 30 minutes of physical activity a day. Knowing this fact, a newsletter of movement activities will be written for each Common Core domain that will allow everyone to be involved and actively moving. (Energizers, 2003)

This math unit integrates sports and movement. It will include Common Core math objectives and best teaching practices that will enhance the math and sports theme. The classroom lessons will contain movement activities that take advantage of teachable moments and enrich the Common Core curriculum. The unit activities will include movement and hands-on actions based on current research that will develop math concepts through active play and fun. Some of the unit activities will include movement activities that can be used as independent learning centers. Yet, many of the unit lessons will include movement activities that more than one student is able to participate in and work cooperatively with classmates. It is hoped that the movement activities will stimulate enthusiasm for math in first graders.

Overview and Objectives

This curriculum unit will take the four Common Core domains for first grade math of operation and algebraic thinking, number and operations in base ten, measurement and data and finally geometry and provided four movement activities for each. The four movement activities under each Common Core domain will contain two learning goal movement activities (on grade level), one remedial movement activity and one enrichment activity. This unit will provide movement activities that can be done in the classroom and outside the classroom setting. This unit will include activities and action games that are cooperative in nature as well as activities that can be done individually. The unit will include four newsletters highlighting movement activities and the critical thinking involved in each domain. This will allow parents to become active participants in helping their child learn the required mathematical concepts. Parents and students will provide a written reflection on how the activity was done in the home and what learning occurred by participating in the activity.

Operations and Algebraic Thinking

Operations and Algebraic Thinking is developing an understanding of addition, subtraction and strategies for addition and subtraction within 20. Students will represent and solve problems involving addition and subtraction. They should understand and apply properties of operation and the relationship between addition and subtraction. Students will add and subtract numbers within 20 and work with addition and subtraction equations. (<http://www.corestandards.org>).

The Common Core objectives for operations and algebraic thinking are as follows: CCSS.Math.Content.1.OA.A.1 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; CCSS.Math.Content.1.OA.A.2 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; CCSS.Math.Content.1.OA.B.3 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.); CCSS.Math.Content.1.OA.B.4 Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that make 10 when added to 8.; CCSS.Math.Content.1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2); CCSS.Math.Content.1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$); CCSS.Math.Content.1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$; and CCSS.Math.Content.1.OA.D.8 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 $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$. (<http://www.corestandards.org>).

Number and Operations in Base Ten

Number and Operations in Base Ten will help students develop an understanding of whole number relationships and place value, including grouping in tens and ones. Students are asked to extend a counting sequence, understand place value and use place value understanding and properties of operations to add and subtract. (<http://www.corestandards.org>).

The Common Core objectives for number and operations in base ten are:

CCSS.Math.Content.1.NBT.A.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral;

CCSS.Math.Content.1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases;

CCSS.Math.Content.1.NBT.B.2a 10 can be thought of as a bundle of ten ones — called a “ten.”;

CCSS.Math.Content.1.NBT.B.2b The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones;

CCSS.Math.Content.1.NBT.B.2c The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones);

CCSS.Math.Content.1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$;

CCSS.Math.Content.1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten;

CCSS.Math.Content.1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used; and

CCSS.Math.Content.1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), 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 and explain the reasoning used. (<http://www.corestandards.org>).

Measurement and Data

Measurement and Data help develop understanding of linear measurement and measuring lengths of various objects. Students will measure lengths, tell and write times as well represent and interpret data that can be placed in a graph. (<http://www.corestandards.org>).

The Common Core objectives for measurement and data are:

CCSS.Math.Content.1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object;

CCSS.Math.Content.1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps;*
CCSS.Math.Content.1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks; and
CCSS.Math.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (<http://www.corestandards.org>).

Geometry

Geometry helps students develop reasoning about attributes of and composing and decomposing geometric shapes. This domain also includes fractional parts (halves, quarters, fourths). (<http://www.corestandards.org>).

The Common Core objectives for geometry are: CCSS.Math.Content.1.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes; CCSS.Math.Content.1.G.A.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape; and CCSS.Math.Content.1.G.A.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. (<http://www.corestandards.org>).

Demographic Background

Ashley Park's vision is to provide all of our students the best education available by using the Family Model to address their needs. My school utilizes the Family Model where our children are assigned to a grade level family that they work with everyday instead of just one classroom teacher. The student's work together in small groups that change throughout the day based upon the needs of each child. A group of teachers and staff members are assigned to work with each family grade level structure to maximize the learning that occurs daily. We believe our Family Model creates a successful learning environment where teachers must work collaboratively to maximize instructional excellence. We believe that in order for students to achieve at high levels they must feel

safe and supported in their learning environment. The learning process must be exciting, engaging and promote higher-level thinking as a way to ensure the academic needs of all students are met. Ashley Park has a belief that strong supportive communication with parents provides a positive impact on learning and that it is important to celebrate our accomplishments throughout the school year.

Ashley Park is a Prek- 8 School that serves approximately 600 children on the west side of Charlotte. We are a part of the Project L.I.F.T. initiative. L.I.F.T. or Project Leadership & Investment for Transformation is a public and private partnership organized as a non-profit organization, operating as one of eight learning community offices in the Charlotte-Mecklenburg School System. The school has a focus on the West Corridor student feeder pattern into West Charlotte High School. The learning community consists of 9 schools. There are four key areas of intervention in which investments will be targeted: Time, Talent, Technology, and invested Parent/ Community support. \$55 million dollars was collectively raised for a five-year pilot in efforts to reform policy that will advance education outcomes for students served in this area.

My first grade students come from economically disadvantaged homes. Over 90% of the students in my school participate in the free/ reduced lunch program funded by the federal government. Key factors in working with economically disadvantaged students are to build relationships, boost engagement and develop a growth mindset. Integrating math and sports and movement activities can provide students in this situation with engaging classroom experiences. “Children of poverty are often at a disadvantage in school, and educators can find it challenging to help such students engaged positively in their own learning” (Gajowski, 2012). Professionals in the field of teaching students of poverty, such as Eric Jenson and Ruby Payne suggest the use of physical activity, music, drawing and positive affirmations to engage students. With the understanding that “children of poverty are being identified and labeled with grossly overgeneralized, deficit-laden characteristics that put them at risk of being viewed as less capable, less cultured, and less worthy as learners” (Sato and Lensmire, 2009). Cooperative learning groups, the use of teams and partner work can also build confidence in students, which will help, increase their academic success. “Students from poverty often need more help engaging in the classroom. To help students become truly engaged, he (Eric Jenson), suggest the use of physical activity, music, drama, social work and positive, affirmations” (Gajowski, 2012) Social work is defined in this context as cooperative groups, partner works, small groups or teams (Gajowski, 2012). Jensen suggests that students should be given opportunities “to make their own choices throughout the school day” in order to develop a “growth mindset which places more importance an attitude, effort and strategy than on luck, genetics, and socioeconomics” (Gajowski, 2012).

Strategies and Activities

This unit will consist of four newsletters. Each newsletter will suggest activities and strategies for movement for each of the four Common Core domain and objectives for first grade math: operation and algebraic thinking, number and operations in base ten, measurement and data and finally geometry. The purpose for the newsletter is to inform parents, build communication between home and school as well as give parents ideas of how they can help their child at home with math skills and concepts. I chose to incorporate newsletters because they are a way to keep parents and students informed and updated on what is happening in the classroom. It is also a way to educate my parents on the Common Core standards. Sato and Lensmire (2009) indicate in their article that when working with students of poverty, it is important to bridge home and school experiences. These math newsletters can help spark interest and increase knowledge of math concepts and skills for students and parents. Newsletters are also fun. They can be interactive and build a sense of purpose and motivation for students. I chose to provide paper newsletters because my students have limited Internet access, yet electronic version can also be sent to parent with email addresses. Below is the current research of why newsletter should be used and the four sample newsletters.

Improved test scores, improved grades, lower dropout rates, and enhanced relationships between school and community are just a few indicated effective responses to using newsletters. Research was conducted and compiled by the National Association of School Psychologist found that newsletters and well-planned home/ school communications can also decrease high- risk behavior, have more positive student attitudes, as well as improved parental opinions of and regards for the school. (Callender and Hansen).

I chose to begin my unit with newsletters to show commitment in keeping parents and children in touch with what is happening in the classroom. It was my aim to help parents be a part of their child's education in an active manner. Regular class newsletters build a sense of community. Eventually the newsletters can include sample student work, reflections and comments of students and parents as they work on the interactive movement activities. The primary goal is for parents to know what is being taught and the expectation for student's success is clear and concise. The newsletters can also eventually be student written.

Callender and Hansen believe that the use of newsletters can improve academic and behavioral outcomes for students. "Families dramatically influence the degree to which children are engaged in school and how they identify themselves as learners. A strong family-school partnership will improve both academic and behavioral outcomes for children" (Callender and Hansen). It is also recommended that "educators need to rely on a variety of mediums to promote open communication including phone calls, letters, e-mail, newsletters, and special note folders sent home with students" (Callender and Hansen)

The newsletters provided in this unit will include the Common Core standard, a section for a math and sports activities, suggestion of other ways to help their child with the math Common Core standard and a section for the date of completion, parent and

child signature and reflection on how the movement activity influenced the students learning.



Operations & Algebraic Thinking

Common Core Standard

- **CCSS.Math.Content.1.OA.B.4**
Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that make 10 when added to 8.*

$$8 + \underline{\quad} = 10$$

Math and Sports Activity

Sing and act out: There was 10 in the bed and the little one said, “Roll over, Roll over” they all rolled over and one fell out. Now there’s 9 in the bed and the little one said

Other ways to help your child at home

- Use objects around the home (buttons, pennies) and make combinations of ten within the 10 boxes below. Put 3 objects in the box. How many more objects do you need to make 10?

$$3 + \underline{\quad} = 10$$

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

We completed the *Math and Sport Activity* on _____ (date).



Parent’s Signature

Child’s Signature

Reflection



Number & Operations in Base Ten

Common Core Standard

- CCSS.Math.Content.1.NBT.A.1**
 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Math and Sports Activity

Create a dance routine that uses 4 counts of 8 (32 counts total). You must change what you are doing every 8 counts.

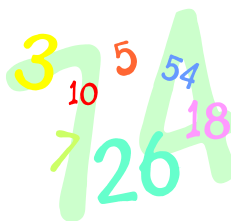
For example: rock for 8 counts; Charlie Brown for 8 counts, Side step for 8 counts and then cabbage patch for 8 counts. Be prepared to perform your routine in class.

Other ways to help your child at home

Count and record how many steps around the perimeter of your room, kitchen, house, yard, etc.

| |
|---|
| Name _____ Steps around my: Room: _____ Kitchen: _____ House: _____ Yard: _____ Which is more? _____ Which is less? _____ Chose another room or area to do. Place _____ Number of steps _____ |
|---|

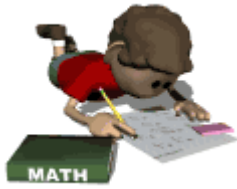
We completed the **Math and Sport** Activity on _____ (date).



Parent's Signature _____

Child's Signature _____

Reflection



Measurement & Data

Common Core Standard

- **CCSS.Math.Content.1.MD.B.3** Tell and write time in hours and half-hours using analog and digital clocks.

Math and Sports Activity

Hickory Dickory Dock;
The mouse ran up the
clock. The clock struck:

- 1:00
- 12:00
- 6:00
- 3:00
- 9:00

The mouse ran down.
Hickory Dickory Dock.
Students are to move their
hand to form the hands on
the clock for each of the
times above. (GetFit TN)

Other ways to help your child at home

Use the brad and paper clock cutout to create an analog
clock. (Attached to newsletter)

Make the following times:

2:00
4:00
6:30
3:30
10:00
11:30

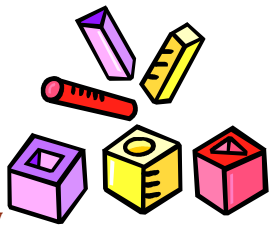
We completed the **Math
and Sport Activity** on
_____ (date).



Parent's Signature

Child's Signature

Reflection



Geometry

Common Core Standard

CCSS.Math.Content.1.G.A.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.¹

Math and Sports Activity

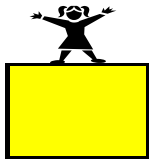
Find four or more people in your family or friends. Make 2-D shapes/ flat shapes with your bodies. Some shapes to make include:

- Triangle
- Square
- Rectangle
- Trapezoid
- Pentagon (five sided shape)
- Rhombus (sometimes called Diamond)
- Hexagon (six sided shapes)
- Octagon (eight sided shape)

Think about it: If a shape has 4 sides, it also has 4 vertices (corners)

Other ways to help your child at home

Go on a shape walk to find 2D and 3D shape.



Take pictures with your XO machine to share with the class.

We completed the **Math and Sport Activity** on _____ (date).

Parent's Signature

Child's Signature

Reflection

Classroom Activities

Active learning and movement activities increase student engagement. Cooperative learning, problem based learning and hands on activities are examples of active learning and are needed to motivate and stimulate learning in classrooms especially in school with high poverty levels. Active learning and movement activities are motivating and engaging for students.

Actively engaging students motivates deeper thinking about course content, brings additional energy to a classroom, and helps an instructor or teacher pin point problem areas. Implementing active learning in a variety of disciplines can promote academic success.

Operations and Algebraic Thinking

For this domain the students will represent and solve problems involving addition and subtraction, understand and apply properties of operations and the relationship between addition and subtraction. Students will also add and subtract within 20. (<http://www.corestandards.org>).

On Grade Level

For addition, students will create a movement activity in pairs (2 people) that creates a combination of ten counts. For example: A student may rock back and forth 1, 2, 3, 4 and a second student will do toe touches for 5, 6, 7, 8, 9, 10. The understanding would be that 4 rocks back and fourth + 6 toe touches = 10 movements.

For subtraction, students will create subtraction word problems and then act out their word problems using loco-motor movements. For example, Santana skipped forward 16 times. He then skipped back 6 times. How far did Santana skip from the starting point? Students may choose to do this activity outside and skip down a sidewalk using the squares to assist with the answer. 16 skips forward – 6 skips backwards = 10 skips from the starting point. The word problems created can be put in individual work centers.

On Grade Level

For addition, students will create a movement activity in a small group of three students that create a combination of ten counts. For example: Student A will rock back and forth 1, 2, 3, 4 and Student B will do toe touches for 5, 4, 7, 8 and finally Student C will do lounges for 9, 10. The understanding would be that 4 rocks back and fourth + 4 toe touches + 2 lounges = 10 movements.

For subtraction, students will create subtraction word problems and then act out their word problems using locomotor movements. Joe rolls to the right 5 times. He rolls to the left 1 time. How many times did he roll from the starting point? 5 rolls forward – 1 roll back = 4 rolls from the starting point. The word problems can be put in individual work centers or stations.

Remediation

For addition, students will create a movement activity in pairs (2 people) that creates a combination of five counts. For example: A student may rock back and forth 1, 2, 3, and a second student will do toe touches for 4 and 5. The understanding would be that 3 rocks back and fourth + 2 toe touches = 5 movements.

For subtraction, the teacher will read out word problems for students to act out or manipulate objects to solve. For example, Sally has 6 blocks in a row. She gave Tom 2 blocks. How many blocks does Sally have now? Students will set up 6 blocks and then take away (-) 2 blocks and end up with (=) 4 blocks. $6 - 2 = 4$.

Enrichment

For addition, students will create a movement activity in pairs (2 people) or in a small group that creates combinations of twenty counts. For example: A student may rock back and forth 1, 2, 3, 4, 5, and a second student will do toe touches for 6, 7, 8, 9, 10. Finally a third students reach to the sky alternating hands and finish the movement activity with the counts 11 to 20. The understanding would be that 5 rocks back and fourth + 5 toe touches + 10 sky reaching = 20 movements.

For subtraction, student will create additive subtraction word problems. For example, Mary has to skip 10 times to reach the park. She has skipped 3 times. How many more skips does she need to do to reach the park? $3 + \underline{\quad} = 10$. Students will use subtraction to help them solve or additive subtraction. To incorporative movement, students are required to act out their word problems created. The word problems can be place in individual work centers.

Number and Operations in Base Ten

For this domain the students will be able to count in sequence, understand place value and use that understanding to add and subtract. (<http://www.corestandards.org>).

On Grade Level

Students have a hundred's chart: This movement activity needs to be done outside or in a large area, such a gym if it is done inside. Students will hold the hundred's charts in their

hands as they travel and move in the given directions. The teacher picks a number such as 34. Then tells the students to move 1 step to the left, which would put the students at 33 or 1 step to the right which would put them on the number 35. The teacher will have students take 1 to 5 steps left or right and ask the student to yell out the number they are “standing “ on.

On Grade Level

This is a clapping game. Students will hit their legs two times then clap two times. Students will chant the following- Hands down on the line; On the list; Names of; Numbers; Starting with 34. The students count around the room keeping the clapping rhythm going. They can start with various numbers and count to 120.

- 85
- 36
- 69
- 50

Remediation

For this activity, students will do various movements as they count 1 to 120. They will change movements for each grouping of 10. For example, they will march 1 to 10, then they will skip 11 to 20, etc.

Enrichment

This movement activity needs to be done outside or in a large area, such a gym if it done inside. Students will hold the hundred’s charts in their hands as they travel and move in the given directions. The teacher picks a number such as 34 and then tells the students to move 1 step to the left, which would put the students at 33 or 1 step to the right, which would put them on the number 35. The teacher will have students take 1 to 5 steps left or right and ask the student to yell out the number they are “standing “ on. To make this more advanced the teacher can ask students to down from 34. For example, the students could move to 24, which equates to subtracting. Students can also move 20 from 34 to 54. In this way, the students are imaging themselves as part of the hundreds board.

Measurement and Data

Students will measure lengths and time. In this domain students learn to tell and write time to the hour and half hour. In addition students will be able to represent and interpret data on a graph. (<http://www.corestandards.org>).

On Grade Level

For this time activity, the teacher will narrate a story taking the students on a typical day. While the story is told, the students will move all around the play area using the designated loco-motor moves to create the times noted in the story. Students will work on loco-motor moves. Students can walk (one step on each beat of the teacher's clap; look for an empty space; head up), run (move with a beat of the teacher's clap look for an empty space with head up), jump (swing arms up, reach for the sky, point toes and land softly), hop (bounce light moving on the ball of your feet), skip (step, hop, step, hop, knees up) or gallop (one foot stays in front as they move). When a specific time of day is called out, they must move to the correct spot and stand side by side creating the minute and hour hands of the clock. All times for this activity should be to the hour such as 3:00, 5:00 or 9:00. The teacher will need to make number cards 1 to 12 and place them in a circle as a guide to how to make the hands of the clock.

For measuring lengths, students will stand side by side and move according to the teacher's directions. Like in the game "Mama May I", the teacher will say take 2 feet forward or move back 5 inches or move sideways 1 yard. This movement activity should be played outside or in a gym or large multipurpose space. To aid in measurement, a tiptoe will represent a inch, one step will represent a foot, and a giant step will represent a yard. The movement activity can also be done using metric measurements as well.

For graphing, students will make a people graph. All the boys and girl will line up in two rows. Students will stand side by side and create a graph with boys in one row and girls in another row. Students will determine if there are more boys or more girls in the graph.

On Grade Level

This time activity is similar to the previous. The teacher again narrates a story taking the students on a typical day. The students move through the play area using the designated loco-motor moves, which are the same as the previous activity. Again, as times are called out, students move to the correct spot and stand side-by-side creating the minute and hour hands of the clock. This activity adds a new dimension, as times should now be to the hour or half hour such as 3:00, 5:30 or 9:00. The teacher will need to make number cards 1 to 12 and place them in a circle as a guide to how to make the hands of the clock.

For this activity, students will use construction paper and markers/ crayon to make a model of their foot, which will aid in measuring lengths. Students will cut out their construction paper foot and use it to make prediction about objects in the room. My foot is larger or smaller than objects in the room such as the stapler, a bulletin board, a chair, math book or a desk.

Students can again make a people graph, standing side by side. As before, this can be used to determine if there are more boys or more girls in the class. In addition, students will compare and determine how many more girls are in the class than boys. Students will also determine how many total students are in the class by using their people graphs.

Remediation

For this time activity, students will do the same time and loco-motor movement activity but will travel with hand held clocks so that they can create the time before moving. This will allow students to visualize where they will be moving to prior to actually moving.

For measuring lengths, the movement activity will be played like the on grade level movement activity. Students will stand side by side and move according to the teachers, directions. Like in the game “Mama May I”, the teacher will say take 2 feet forward or move back 5 inches or move sideways 1 yard. This movement activity should be played outside or in a gym or large multipurpose space. (a tip toe represents a inch; one step represents a foot; a giant step represents a yard). If these measurement terms are too difficult the terms small, medium and large steps can be used instead of inch, foot and yard.

For graphing, the teacher will chose 5 students to make a people graph. For example, the teacher will choose 3 girls and 2 boys. The students will line up side by side. The teacher will ask are there more girls or boys? How many more girls then boys? How many students in the graph (survey)?

Enrichment

For this time activity, students will do the same time and loco-motor movement activity. The teacher will however, incorporate times in the narrative that include quarter till and quarter after such as 3:15 or 6:45 as well as times to the hour and half hour.

For measuring lengths, students will move around the room with a ruler finding things in the room that are approximately one inch, one centimeter, one foot, etc. The teacher may want to play music and have students to find an object that is one foot before the music stops.

For graphing, the teacher will list 3 to 5 sports. Students will move to the sports they like the most. Students will record this information or data using tally marks. Then the students will create a people graph of their data. This group can also create and organize the people graph into a picture or bar graph and create questions from the data collected. The graphs and questions developed can be used in a center or workstation.

Geometry

Geometry is the visual study of shapes, sizes, patterns, and positions. This standard requires students to explore two-dimensional and three-dimensional shapes. Students will also look at fraction parts of halves and fourths/ quarters. (<http://www.corestandards.org>).

On Grade Level

For shapes, students will need pictures of the 2D shapes. Then, the class will learn and sing a variation on the Hokey Pokey song: Put the square in; Pull the square out; Put the square in and shake it all about. Do the hokey pokey and turn yourself around. That's what it's all about. Substitute the square for

- Rectangle
- Circle
- Square
- Trapezoid
- Hexagon

For fractional parts, Students will receive a piece of a circle, square, rectangle or some other 2D shape. Students will move around the room find the other pieces to create the whole shape. For example, a student may have $\frac{1}{2}$ a circle and another student has the other $\frac{1}{2}$ of the circle. They are to find each other to complete the whole circle. These cards can be put into workstations or centers.

On Grade Level

For shapes, students will need pictures of the 3D shapes. Using the Hokey Pokey song: Put the sphere in; Pull the sphere out; Put the sphere in and shake it all about. Do the hokey pokey and turn yourself around. That's what it's all about. Substitute the sphere for

- Cone
- Pyramid
- Cube
- Rectangular Prism
- Cylinder

For fractional parts, Students will make cards with circles and squares divided into 2 equal parts and 4 equal parts. Students will also have cards that show the fractions $\frac{1}{2}$, and $\frac{1}{4}$. In addition students will have the words half, halves, fourths, quarters. Students will

walk around with these cards on their backs and will ask questions to find their partners. The partners will include the word, the fraction and the picture. These fraction cards can be put in work -stations or centers.

Remediation

For shapes, the teacher will post pictures of 2D and 3D shapes around the room. Students will be given a shape to match with the posted shapes. Students will be asked to skip, hop, take giant steps around the room to the matching shape. (GetFit TN).

For fractional parts, Students will sit in a circle. They may be in chairs or on the floor. With string students will divide circle in fractional parts. Students will pull the string to show 2 equal parts and 4 equal parts. This activity can be repeated sitting in a square and sitting in a rectangle.

Enrichment

For shapes, the teacher will pass out UNO cards. Students will identify the color on an individual card. Students will begin moving around the room - jumping, marching, hopping, etc. When the teacher calls out a shape, the students will look at their card. Students will gather in groups of like colors and create a 2D shape or 3D shape indicated by the teacher. UNO cards have the colors blue, red, yellow and green. For this movement activity the student with blue UNO cards will form the group to create the shape.

For fractional parts, students will divide up in groups of 5. Each group will need a hula- hoop. Students will be asked to fill up half of the hula- hoop or $\frac{1}{4}$ of the hula- hoop. This activity can be extended to include $\frac{1}{3}$ of the hula-hoop or $\frac{2}{4}$ of the hula-hoop.

Conclusion

The intent of this unit was to incorporate movement activities and math concepts to help students in first grade at my school and schools like mine understand the needed skills to be competitive with their peers. I wanted to use cooperative strategies and promote positive changes in instruction, discipline, and class environment that lead to successful math instruction and learning. The efforts to increase time for arts, sports and physical education in schools especially schools of poverty have proven research indicating increased academic success. Including sports and physical activity in a lesson allows a teacher to increase interaction among students maintain high expectations and build relationships.

Integrating math and sports or movement in math instruction can “improve students health, cardiovascular capacity, muscle strength, body coordination, speed,

reaction times, and stress responses athletics enhance cognitive academic outcome problems”(Jensen, 120) “Some studies have found strong evidence that exercise increases the production and functionality of brain cells in mammals, which are highly correlated with learning, mood and memory” (Jenson, 120).

Active participation is critical to engagement in the classroom environment. “Students who took part in the early morning exercise program right before . . .class earned higher scores than students who had exercised more than two hours before the class or who hadn’t exercised at all”(Jenson, 125). Just imagine what could be possible if student are exercising and moving within a math lesson. With this unit, we all get to benefit from finding out!

Appendix 1

Implementing District Standards

North Carolina Standard Course of Study

This curriculum unit will take the four common core domains for first grade math of operation and algebraic thinking, number and operations in base ten, measurement and data and finally geometry and provided four movement activities for each.

Operations and Algebraic Thinking

The Common Core objectives for operations and algebraic thinking are as follows: **CCSS.Math.Content.1.OA.A.1** 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; **CCSS.Math.Content.1.OA.A.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20; **CCSS.Math.Content.1.OA.B.3** Apply properties of operations as strategies to add and subtract; **CCSS.Math.Content.1.OA.B.4** Understand subtraction as an unknown-addend problem.; **CCSS.Math.Content.1.OA.C.5** Relate counting to addition and subtraction; **CCSS.Math.Content.1.OA.C.6** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10; **CCSS.Math.Content.1.OA.D.7** Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. **CCSS.Math.Content.1.OA.D.8** Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

Number and Operations in Base Ten

The Common Core objectives for number and operations in base ten are: **CCSS.Math.Content.1.NBT.A.1** Count to 120, starting at any number less than 120; **CCSS.Math.Content.1.NBT.B.2** Understand that the two digits of a two-digit number represent amounts of tens and ones; **CCSS.Math.Content.1.NBT.B.2a** 10 can be thought of as a bundle of ten ones — called a “ten.”; **CCSS.Math.Content.1.NBT.B.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; **CCSS.Math.Content.1.NBT.B.2c** The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones); **CCSS.Math.Content.1.NBT.B.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$; **CCSS.Math.Content.1.NBT.C.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one

adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten; CCSS.Math.Content.1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used; and CCSS.Math.Content.1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), 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 and explain the reasoning used.

Measurement and Data

The Common Core objectives for measurement and data are:

CCSS.Math.Content.1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object; CCSS.Math.Content.1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlap; CCSS.Math.Content.1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks; and CCSS.Math.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Geometry

The Common Core objectives for geometry are: **CCSS.Math.Content.1.G.A.1** Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes; **CCSS.Math.Content.1.G.A.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape; and **CCSS.Math.Content.1.G.A.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Bibliography for Teachers

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Reading List for Students

Primary-Grades Math Book List

Counting and Pre-Number Activities

Each Orange Had 8 Slices (P. Giganti & D. Crews) Five Little Monkeys Jumping on the Bed (E. Chisto) How Much is a Million? (D. Schwartz)
Joe Can Count (J. Omerod)
Moja Means One (M. Feelings & T. Feelings) Mother Goose Math (H. Ziefert & E. Bolan)
My Numbers (R. Emberly)
Ten Apples Up on Top (Suess, T. Lesieg)
Ten Little Dinosaurs (P. Schnetzeler)
Today is Monday (E. Carle)

Number Operations

A Remainder of One (B. Mackain)
Even Stephen and Odd Todd (K. Christaldi, H. Morehouse, & M. Burns) Math Curse (J. Scieszka & L. Smith)
Math for All Seasons (G. Tang & H. Briggs)
Math Magic (S. Flansberg)
Math Manipulatives and Magic Wands (K. Simmons & C. Guinn) Monster Math (G. MacCarone & M. Hartelius)
Skittles Riddles Math (B. Barbieri & R. Glass)
The Door Bell Rang (P. Hutchinson)

Geometry

Family Math (G. Coates & A. Williams)
Geometry (J. Jurgensen & R. Brown)
Grandfather Tang's Story (T. Perte)
Grapes of Math (G. Tang & H. Briggs)
Math Games and Activities from Around the World (C. Zaslavsky)
My Shapes (R. Emberly)
Picture Pie (E. Emberly)
Sir Cumference (C. Neuschwander & W. Geehan)
Sir Cumference and the Knight of Angleland (C. Neushwander & W. Geehan) The Greedy Triangle (M. Burns & G. Silvers)
The Shape Game (P. Rogers & S. Tucker)
Wings on a Flea (E. Emberly)

Measurement

How Big is a Foot? (R. Myller & S. McGrath)

Inch by Inch (L. Lionni)
It's About Time, Max (K. Richards & Gioiammenghi)
Me and The Measure of Things (J. Sweeney & A. Cable)
Pigs Will Be Pigs (A. Axelrod, S. McGinley-Nally, & E. Krieger) Tell the Time with
Teddy (G. Davis)
Temperature and You (B. Maestro & G. Maestro)
The Grouchy Ladybug (E. Carle)
The Long Wait (A. Cobb & L. Woodruff)
The Penny Pot (S. Murphy & L. Woodcock)

Fractions

Eating Fractions (B. McMillan)
Fraction Fun (D. Adler & N. Tobin)
Funtastic Math Decimals and Fractions (C. Mitchell)
Give Me Half (S. Murphy & B. Karas)
Hershey's Milk Chocolate Bar Fraction Book (J. Pallotta & R. Bolster) Menu Math (M.
Lee & M. Miller)
Twizzlers Percentage Book (J. Pallotta & R. Bolster)

Miscellaneous

Bunny Money (R. Wells)
G is for Googl (D. Schwartz & M. Moss) If I Made a Million (D. Schwartz)
Jim and the Bean Stalk (R. Briggs) Measuring Penny (L. Leedy)
More M&M's (B. Barbieri McGrath & R. Glass) Mouse Count (H. Stowell Walsh)
One Hundred Angry Ants (B. Mackain & E. Pinczes) Reese's Pieces (J. Pallotta)
10 Black Dots (H. Stowell Walsh)
The Best of Times (G. Tang & H. Briggs)
The M&M's Counting Book (B. Barbieri McGrath & R. Glass)
The Sly Piranhas (W. Wise & V. Chess)
Three Warhogs in the Kitchen (H. Stowell Walsh)
26 Letters and 99 Cents (T. Hoban)
Two of Everything (L. Toy Hong & J. Mathews)
Welcome Books: Triangles, Squares, Circles, Rectangles, Ovals (J. Burke)

Works Cited

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Nov. 2013. <http://www.cesa6.org/cms_files/resources/Math%20-%20book%20list%20McNamara.pdf>. This is comprehensive book list of primary math
read aloud book.

List of Materials for Classroom Use

1. Hundred's Chart
2. Number Cards 1 to 12
3. Fraction cards $\frac{1}{2}$ and $\frac{1}{4}$
4. Fraction cards half, halves, fourth, quarter
5. Fraction cards $\frac{1}{2}$ and $\frac{1}{4}$ of a circle, square, rectangle
6. String
7. Music
8. Time cards (hour and half hour times)
9. 2D and 3D shapes
10. 2D and 2D shape names