OPERATIONS AND ALGEBREIC THINKING (OA)

First Grade – How many ways can we make a sum?

1.OA.3 Apply properties of operations as strategies to add and subtract.3 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.)

Have students work in pairs. One student bounces the ball and one throws the ball in the air and catches it. How many ways can they create sets of 10. Have them record their results.

Example: Jose can bounce 10 and Loritha can throw 0. Jose can bounce 1 time and Loritha can throw the ball 9 times in the air which makes a set of ten. Jose can bounce 2 times and Loritha can throw 8. Jose can bounce 3 and Loritha can throw 7. Jose can bounce 4 and Loritha can throw 6. Jose can bounce 5 and Loritha can throw 5. Jose can bounce 6 and Loritha can throw 4. Jose can bounce 7 and Loritha can throw 3. Jose can bounce 8 and Loritha can throw 2. Jose can bounce 9 and Loritha can throw 1. Jose can bounce 0 and Loritha can throw 10.

Questions: What do you notice about the data? They should recognize 6+4=10 and 4+6=10. This is the commutative property. Also any number + zero is equal to the number. (This is the zero property of addition). Help them notice the patterns. Ask them what would happen if you were looking at combinations of 12, 13. How many different possibilities are there for different numbers? Look at what happens at 5 + 5. When will numbers have a number plus itself? When will this not occur?

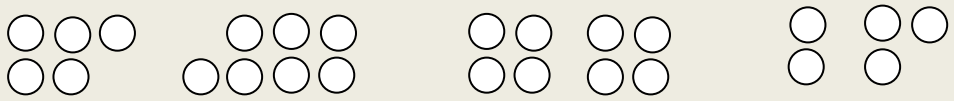
Second Grade – Odd and Even Groups

2.OA.3 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.

Have students get into a circle. Count to 5 and have them get into groups of any number. The groups can be any size from one student to all. Most likely you will have groups with 2, 3, 4, 5, etc. Have each group get into pairs by standing across from one another. Have them determine if their number of people in their group is odd or even. (Even numbers are represented by every person having a partner and odd numbers are represented by one person not having a partner. Now have them try to get into all groups that are odd and prove the number is odd by getting into partner positions. (This may not work if you have certain numbers of students, but that is ok. The teacher can always join the group for another go around and find out what happens by adding one to the number of people in the class). Can they get into all even groups? Have an even group combine with an odd group by running to the corner of the gym. Have them hold hands and move down the gym like they would in square dancing. What happens? Is the number odd or even? Have two even groups combine by running to a different part of the gym. What happens? Have two odd groups combine by running to a different part of the gym.

What happens? Always have students prove their answers by getting in original groups and then combining them.

Example: If a group of 5 (odd) combines with a group of 7 (odd) have them first run to the corner of the gym and get into their original configurations then combine. The combinations should look like this. (odd plus odd = even) (even and even = even) (even and odd = odd)



Questions: What patterns do you see? What would happen if you combined an odd, odd, and even? Have them check and prove their conjectures.

Third Grade – Numbers on the Floor

3.OA.4 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 8 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?.

Teacher throws out the numbers 1-9 on the floor. You should have a set of 1-9 for each child in the class and all should be spread out all over the floor in random order. The Teacher says 8 x ? = 40 and all of the children have to run to that number and stand on it.

A variation could be that there are not enough numbers 1-9 for each child so they can either stand on the number or find a combination of numbers that can be multiplied to make 40. Example: 2 x 5 x 4. If they pick these numbers up and can prove they equal 40 in some way, they are safe. Students can be put into teams. Teams where members are standing on the needed number get 1 pt. and those that find other ways to make the number by multiplying get 2 pts. *Once a child is on a number or has numbers they cross their arms to indicate they cannot be touched.

Fourth Grade – Factors and Multiples in Movement

4.OA.4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Factors – The teacher determines a number and tells the students the number out loud. The students must bounce a ball (or complete some other action) in sets of numbers to see if the number the teacher provided is the last number in a given set.

Example: The number the teacher gives is 12. If I bounce in sets of 1 I can get to the number 12. If I bounce in sets of two, I can get to the number 12 since it is the last number in a set: 2, 4, 6, 8, 10, 12.

If I bounce the ball in sets of 3 I can get to the number by completing 4 sets. If I bounce the ball in sets of 4 I can get to the number by completing 3 sets. If I try sets of 5 I will never get to 12 by completing any number of sets. If I bounce 6 in a set, I have to complete 2 sets. 7, 8, 9, 10, 11 in a set will not work. 12 in a set and the completion of 1 set works. That means that the factors for 12 are: 1, 2, 3, 4, 6, 12. If you give students a prime number the only numbers that will work are the number and itself. Have them try this for a multitude of numbers. Have them keep track of their data.

Multiples: The teacher asks, "Is 30 a multiple of 5?" Prove it by bouncing the ball. The student would bounce 6 sets of 5 or could solve the problem by bouncing the ball one time and counting by 5, whereby reaching the number 30. Example: 5, 10, 15, 20, 25, 30.

To show how skip counting is really indicating multiples, you can put the students in a line. Have them count off down the line by 5s. Then indicate how multiplication is involved. First person in line steps forward and says "1 x 5 is 5". While doing this they jump, cross arms like a multiplication sign, jump and put out their hand to indicate 5 and then make up a movement. All of the other students repeat the student's sequence while repeating 1 x 5 is 5. Then the next person says, "2 x 5 = 10" and jumps, crosses arms, puts out their hand to indicate five and makes up a movement. The students follow along again and it goes down the row.

Ask students if 41 is a multiple of 7? How can they prove it by some sort of movement? Allow creative responses. They may say out loud 7 x 5 is thirty 35 and then bounce 7 more and get 42 or they may bounce 6 more times and get 41. You have to listen to their explanations of why 41 is not a multiple of 7.

Questions: Find 2 numbers with 3 factors in common. Find 3 numbers that are multiples of a given number. Prove your solutions with physical movements.

Fifth Grade – T Table Patterns

5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Students are given a "t" table. They must complete the table with an action. Frisbee throws will be used as an example. The first time they throw the Frisbee 3 times. The second time 6 times. The third time 9 times. The fourth time they must figure out the pattern. The pattern is 3(n) meaning that the number is multiplied by 3 in order to determine the number of throws they must complete. The way that you know it is 3(n) is that there is a difference of three Frisbee throws for each successive answer. The answers would be 12 and 15 and they must complete the throws and fill in the table. If we use

jumping jacks as an example it may look like this. What is happening? They start out with 3 and add 2 each time. The answers would be 9, 11 but the formula is always in terms of the number. So the difference between each successive number of jumping jacks is 2 so the formula starts with 2(n). If you multiply 2(1) you get 2. The first answer however is 3 which means you need to add one more. So the formula is 2(n) + 1.

Questions: What patterns do you see? What number would it be if we looked at the 100th number? The 20th number? Can you make a table and complete an activity and have the numbers 2 and 7 in the table?

Number	Frisbee Throws
1	3
2	6
3	9
4	
5	
n	

Number	Jumping Jacks
1	3
2	5
3	7
4	
5	
n	

NUMBER AND OPERATIONS BASE TEN (NBT)

First Grade – Counting Activities from n to n+23

1.NBT.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.

When students are doing jumping jacks, or bouncing a ball, or taking steps, have them count starting with a given number and do the activity until a specified number.

Example: Start jumping on 58 and count and jump until you get to 71.

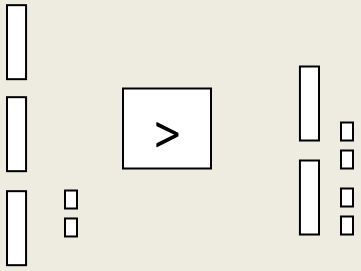
First Grade – Base Ten Block Shuffle

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

Have each student run to the side of the gym and pick up either a Base Ten rod or a unit cube. Then have them get into groups. Have the students with the tens in the group stand on the left of the students with the ones and have them get in a single file line. Those students with ones will stand on the right of the tens in a single file line. Give one student a card with a > sign on one side and an = sign on the other. Put two groups in position with a bit of space between

them and then have a student determine how the sign should read in order for the inequality to be correct.

Example:



The first group of students equals 3 tens and 2 ones. The second group represents 2 tens and 4 ones. Since 32 is greater than 24 the greater sign goes in the middle. Have the students say the sentence. 32 is greater than 24.

Transitioning to numerals after you have completed Base Ten Model Game - Students can be allowed to pick up a number on the outside of the gym. Each child picks up a single number from zero to nine. Then they come back and get into groups of 2 if they are working on 2 digit numbers and 3 if they are older students working on larger, 3 digit numbers. They are asked to compare themselves to another group and use the greater than, less than or equals sign in order to make the inequality true.

Questions: What is the smallest number you can make with your group? What is the largest number you can make? Can you make a number larger than 25? Can you make an even number? An odd number… When they are finished they jump so the teacher knows to look at their answer. They jump and then squat to the floor if it is not possible. When everyone is done they run for another card and get into groups with people they have not already worked with on the first go around.

Second Grade – Counting Physical Activities by 5s, 10s, and 100s

2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s.

How far would it take to take a step for each multiple of 100 and reach 1000? Place a cone where children believe this will happen. Then walk to the cone taking large steps counting 100, 200, 300, etc. until you have taken 10 steps and have reached 1,000. Do the same thing but now using the multiples of 5 and 10.

Count any and all activates by 5s, 10s, 100s, knowing you do not always have to reach 1,000. Time children and ask them to complete a motion and count by 10s. Stop the clock and find out what number each group reached.

Example: All groups complete jumping jacks and count by the multiples of 5 each time they jump. After 15 seconds, one group gets to 20, one group gets to 50 and one group gets to 45. You could then use >, <, = to compare the results.

Second Grade – Base Ten Block Shuffle

2.NBT.1 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.

See – Base Ten Block Shuffle for 1st grade and use 3 digit numbers rather than 2 digit numbers. Also, you will need hundreds Base Ten Blocks for this activity. This grade can use playing cards for creating numerals since they will likely not be confused by the Ace representing a numeral 1.

Third Grade – Adders and Subtracters

3.NBT.2. 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.

The teacher has a sequence of numbers already developed for adding and subtracting. (This is important so that you do not have to have 1000 numbers hung on the walls around the gym. The teacher begins the sequence. The students add in their heads. If they are adding a one digit number one foot must stay on the floor (a skip, a slide, etc.) for that many iterations and they must go in a forward motion. If they are subtracting a one digit number one foot must stay on the floor for that many iterations and they must go in a backwards motion. If they are adding a number with a tens digit, the tens in the number will be motions in a forward direction and their feet must leave the floor. If they are subtracting a number with a tens digit, the tens in the number will be motions in a backwards direction and their feet must leave the floor. If they are adding a number with hundreds they must move in a forward motion and their hands must touch the floor in front of them. If they are subtracting a number with hundreds their hands must touch the floor in a backwards motion behind them.

Example: Teacher says seven (the children keep their feet on the floor and skid in a forward motion seven times) and then run for the seven on the wall of the gym. The teacher says plus 23. (The students hop 2 times with their feet leavening the floor in a forward motion (representing the tens in the number) and then slide 3 times in a forward motion (representing the ones in the number) and run for the number 30 on the wall. The teacher says plus 102 (the children reach down and touch the ground in front of them one time which represents one hundred and then skip 2 times going forward which represents the ones digit) and the children run for the number 132 on the gym wall. Then the teacher says subtract 111 and the children touch the floor behind them which represents the one hundred, they hop back one time which represents the one ten, and they slide back 1 time which represents the one. This can go on and on. The only numbers needed for the walls for this example are 7, 30, 132 and 21. This can also be done with multiplication and division for older children. Example: 7 + 5 X 3 +17 x 0 + 12

/5…… (Note that order of operations is not a part of this activity, but rather the teacher has the children do each step in order. Make sure that when you have them divide that the answer is a whole number.

Fourth – Jump Left or Jump Right

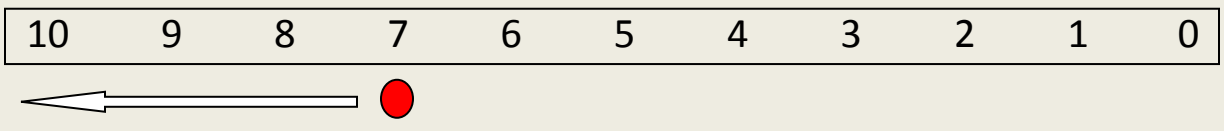
4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.

Teacher makes number lines from 1 to 10 and places them on the floor. IT IS NECESSARY T HAT THE ZERO BE ON THE CHILDS RIGHT AND THE TEN ON THE CHILD'S LEFT. THIS IS BACKWARDS FROM NORMAL BUT IT INDICATES NUMBERS FOR PLACE VALUE. GOING TO THE LEFT IN PLACE VALUE MEANS GETTING LARGER WHEREAS GOING TO THE RIGHT INDICATES GETTING SMALLER IN PLACE VALUE. You can laminate adding machine tape with number on them for ease and each number line should be approximately 6 feet. Teacher has a stack of numbers written on large pieces of paper which he/she shows the students and says to round to the nearest tens, hundreds, or thousands. Then the children go to the given number and then jump to show whether they are going to round up or down.

Example: If the teacher shows the number 47 and says to round to the nearest tens the children will position themselves on the seven because this is what they need to decide whether to round up or down. Once everyone is on the seven the teacher says round and the children jump to the zero or the ten. In the case of 47, they would jump to the ten and yell 50. If the teacher showed the number 124 and said to round to the nearest hundred, the children would stand on the 2 and decide whether to jump up to the ten or down to the zero. In this case they would jump down to the zero and yell 100. * The teacher must recognize that the number line in front of the students does not represent ones, tens, or hundreds, but rather the number of each in the digit place specified. If they are rounding to the nearest tens the numbers on the line represent the number of ones. If they are rounding to the nearest hundred, the numbers on the number line represent the number of tens. If they are rounding to the nearest thousand, the numbers on the number line represent the number of hundreds.

Example for the number 47.

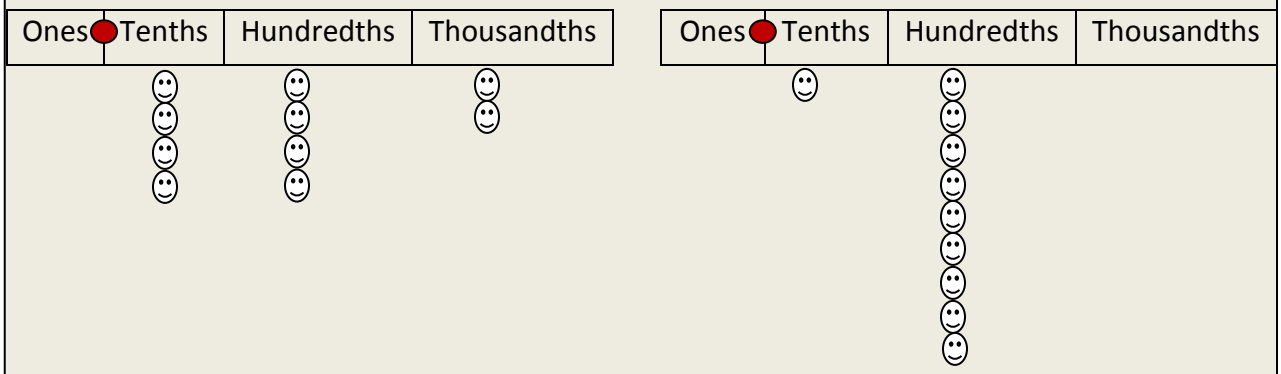
Round UP! Round DOWN!



Fifth Grade – Decimal Face off

5.NBT.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Students are placed in teams. On the floor is a place value chart. Another one exactly like it is placed to the left or right of the first chart. Teacher says "go" with a specific directions. Example: you must have 4 hundredths and we are looking for the smallest number. The students run to the chart that is not in front of them and get in order on the chart. Once positioned, the teacher says tenths run to the wall and both groups do so in a single line that is perpendicular to the chart. "Can we tell which is smaller" the teacher asks? If yes, that team with the smallest number gets a point as long as they also have at least 4 hundredths. Have the hundredths run to the wall to make sure there are 4 and then have the thousandths run to the wall. Have students from the opposite team count the persons in each group.



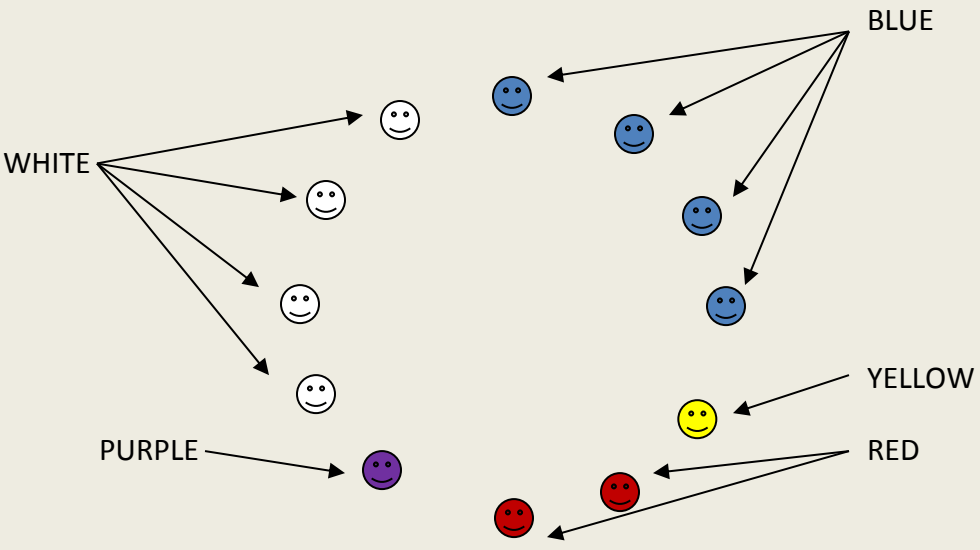
In this example we are looking for the smallest number and they have to have at least 4 in the hundredths column. When the tenths run to the wall we can tell that the number on the left 0.19 is smaller than 0.442 because it has the smallest number of tenths. * BE CAREFUL NOT TO LET A GROUP PUT MORE THAN 9 PEOPLE IN A COLUMN OR IT WILL NOT BE A TRUE BASE TEN NUMBER. Play and keep score by 5s, 10s, 100s, 1000s, or by some other number where you can keep track of multiples. Scores are in multiples of 7, 23, 61, etc.

NUMBER AND OPERATIONS FRACTIONS (NF)

Third Grade – Groups of Fractions

3.NF.1. Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

Teacher has the students run to the outside of the room and pick up a color chip – paint chips work well. You only want to have 10 of each color and at most 5 or 6 different colors. They run back to the middle of the room and get into a circle where they are equidistant apart and similar colors are next to each other. (In other words, you want all blue together in the circle, all red together, etc.). It is best to have them grab hands and spread themselves out evenly into a circle and then drop hands. First they count off to determine how many in the circle. Then you ask them what they represent. Each child says 1/? (Depending on the number of people in the total circle – if there were 12 in the circle they could respond with 1/12). Go around the circle and have each say 1/12 and jump up. Each child will say 1/12. Then the teacher indicants a color, and asks how much of the circle is blue? for example blue. The first person with blue does a movement and says 1/12 and the others follow saying 1/12. The second person with blue says 2/12 and makes a different movement and the others follow saying 2/12 and making the movement. The third says 3/13 and a movement and the others follow, the 4th (if it is the last blue chip) says 4/12 and shouts "I'm the answer" and the others say 4/12 - I'm the answer and make the movement. The teacher can change the color and complete the activity again with the same circle or the teacher can have the children create circles within circles which will give different answers for the denominator. * If you don't ever transition to circles within circles the answer will always be the same denominator. If the teacher does not have colored chips, this can be done with the color of shirts, eye color, hair color, etc.



Fourth Grade– Two Color Equivalent fractions

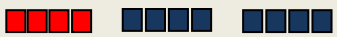
4.NF.1. Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

The teacher throws down 12 colored chips per group, 4 of which are one color (red) and 8 of which are a different color (blue). The group must determine all of the ways that the chips can be distributed given 2 rules. One rule is that no colors can be combined in a group and the other rule is that every group must have the same number. Once students get one of the ways that the chips can be organized they make a movement until the teacher comes over to check their work. They then are told to go to folder number 1 and get a slip of paper. They then work on another solution. When they finish that, they make a movement to get the teacher's attention, and the teacher has them run to another folder with another slip of paper. Solutions correspond to the papers that they pick up at stations around the room. Once they have gotten all of the solutions and the papers (teacher needs to have a list of solutions and what folder they need to go to) they have to put the papers together in order which will tell them the first steps of a crazy dance routine. They then quickly pick up another paper that has a different problem. This continues until they have as many papers as they can get. They put the papers in order and complete the routine and the group with the moves wins.

Example: with 4 red and 8 blue here are the combinations.

 Is equal to 4/12. Students show solution and are sent to get paper. (Move 1 – Put your right foot right and bring it back to center, put your left foot left and bringing it back to center).

 Is equal to 2/6. Students show solution and are sent to get paper. (Move 2 – Walk forward 4 steps swinging your arms and walk back 4 steps moving your arms).

 Is equal to 2/6. Students show solution and are sent to get paper. (Move 3 – Turn your body 180 degrees to the left and 180 degrees to the right.)

When they are finished with all three solutions they start the problem that has 6 red and 12 blue. And get the moves for this puzzle. When they are done they have to complete their routine in order.

Fifth Grade – Can you do this ½ x 4 times?

5.NF.5b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1.

Teacher provides the students with an activity sheet that tells them how many times to complete a different action at each station. The first station says: Throw the ball ¼ x 8 times and they need to figure out that the answer is 2 times. * It is imperative that children understand that in this case the multiplication sign means "of". They then go to the next station and it says the action that they will take and it says to complete it ½ x 16/1. They need to determine that it is 8 times. Then they go to another and it says to do something 2/3 x 9/1. And on to the next station where it says 1/7 x 21/1.

Students can also be asked to get into groups and to find ½ of ½. If they are in a group of 8 then half would be 4 and a half of a half would be 2 or ¼ or the original 8.

MEASUREMENT AND DATA (MD)

First Grade – Measuring Animal Lengths with jumps

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

Before the lesson, the teacher should go to http://twistedsifter.com/2012/04/15-of-the-largest-animals-in-the-world/ and determine the animals that they want to use and their sizes. Use tape on the floor to indicate the length of animals. Then have students compare one animal to another.

Example: Compare the length of a blue whale to the height of a giraffe using non-standard measurement. Students can put foot in front of each other to count off number of feet, or measure number of skips, or number of hops for each animal. They must be certain to not change the way they are moving when they are measuring each. In other words, it would not be appropriate to take little steps for the whale and big steps for the giraffe. After they do this they will write their data on a piece of paper and keep track of how much bigger one is than the other. You can have them compare 2 different animals by skipping and 2 different animals by hopping. Then come to the board and put up the data for the number of skips a certain animal is. The data will be different. Ask them why the data is different and guide them

to understand that the measurement was not standardized and that each person has a different size skip.

Second Grade– Human Clock – 5 minute intervals

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Teacher places children in a circle at every 5 minute interval of a clock. If you have more than 12 students, one can stand behind another at a given interval. Have students around the clock count by 5s and when it gets to their interval they will hop. They should count with all the other children but only hop on their interval. After this has been done, hand each child a 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12. Mix them up and then have them place themselves in order of the clock. Have 2 children get on the inside of the clock. One will have a yard stick and the other a ruler. Have the yardstick (minutes) point to a number. Count by fives to figure out how many minutes. Then have ruler person say an hour. They must decide where to put the hour hand. If it is 30 after it will be between the number they indicated for the hour and the next hour. If it is 45 minutes after it will be ¾ of the way past the number they indicated and ¼ till the next number. Have students say the number. Have the students hop over to the side of the gym and put down their numbers, yardstick or ruler and hop back to where the clock was. Have them now skip to the side of the gym and get a new number or stick. They then walk fast and position themselves in the clock formation again and it starts over. * Be aware that the 12 will determine the direction the clock is going. If he positions himself facing west it will be different than if he positions himself going north.

Third Grade– Look What I Can Do from 2:31 to 2:35

3.MD.1 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.

Teacher has the students repetitively complete a motion from a given time to another time. The students determine the number of times this motion can be completed during the interval. The data can be placed on a line plot graph and then compare one motion for a given number of times to a different motion. Have the students do the time keeping.

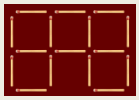
Create word problems. If they completed 23 motions in 4 minutes how many could they likely complete in 8 minutes? 12 minutes? This can also be competed with heartbeats for short intervals of at least 1 minute.

Fourth Grade – Ruler Match Stick Puzzles

4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Teacher provides students with what are called matchstick puzzles. They take yardsticks to solve on the floor of the gym. Each person takes turns moving the sticks. If it is not their turn they can give advice but not touch the sticks. When they find a solution, they must use their bodies to show it on the gym floor. If you don't have enough students in a group, adding machine tape about the size of a student can be used for the body part of the activity. Many more puzzles like these can be found on ipad apps and online. Students must be able to tell the area and perimeter of starting shape and the ending shape.

 **Move** 2 to form 4 equal squares.

 Move 3 to form 4 equal squares.

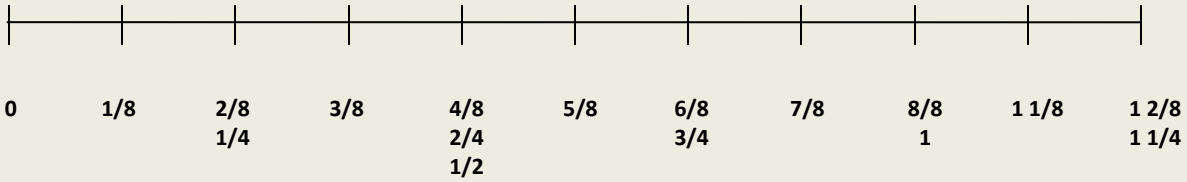
 Move 3 to form 3 equal squares.

Fifth – Cotton Ball Throw Line Plot

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).

Teachers provide students with a cotton ball that they must throw 5 times. You can color the cotton balls with marker so that more than one child can throw at a time. Groups of students throw their cotton balls on a ruler that is marked on the ground. They then put the distance they threw it to the nearest ½, ¼, 1/8.

Example: Students start at zero and throw their cotton ball. Then their data is put on a post it note and put on a line graph like this on the board. Then the data is examined. Make sure students understand that these are units not inches, centimeter, meters, etc. They are simply unknown units.



GEOMETRY (G)

First Grade– Sentence Strip Shape Aerobics

1.G.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.

Teacher has a sentence strip with shapes on it. The shapes correspond to a given movement. They then complete the pattern of movements that corresponds to the shapes. Colors can also be used so that color represents a small movement and shape indicates a large movement. Also, the students must complete the movement for each of the vertices of the shape.

Triangle = hop, quadrilateral = turn around 360 degrees, pentagon = one jumping jack, hexagon = reach down and touch the ground and then jump up.

Red = snap, green = flap your hands, blue = move your left foot in a circle, yellow = flap your arms.

Color movements precede shape movements.

Example: 

Students would flap arms and then hop. They would do this combination 3 times since there are 3 vertices. Then they would move left foot in a circle and turn around 360 degrees. They would do this combination 4 times since there are 4 vertices in a quadrilateral. And so on. It is best to begin with just color or just shape and then combine them. Also best not to start with such a difficult pattern and then work up in difficulty.

Second – Building Rectangles and Counting

2.G.2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

Teacher has the students get into a rectangular array. Then they have to figure out how many without counting. While in the array they can hop, walk, etc.

Example:  They can count 3 + 3 or they can count 2 + 2 + 2. Either way the answer is 6.

Ask, can you make a rectangle with 12? Can you do it another way? Can you create a rectangle with 13? *Don't forget that a square is a special kind of rectangle.

Third Grade– Partitions of People Shapes

3.G.2. 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.

Put students in groups of 6-8. Have them create anytime of shape with their bodies and divide it into equal parts. Give them rulers in case they need more bodies and don't have them. Give them a ball to indicate a fractional unit ¼ by placing the ball in one of the 4 squares (this is if they are working with 1/4s).

Example: Eight children create a square with 2 students on each side. They then use the rulers to divide the square in fourths. They then place the ball in one of the four equal parts and indicate that it is ¼. Can they divide the square another way? They can work with circles, squares, rectangles, parallelograms, trapezoids, pentagons, hexagons, etc. Have them work with fourths, halves, thirds and get more complicated from there.

Fourth Grade– Geometry Vocabulary Aerobics

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Teacher starts out by completing an angle aerobics routine with the students. Then he/she provides an example of the vocabulary words. Then give students 7 minutes to come up with their own routine. Rules, every geometry word must be represented at least 1 time with a movement that looks like the math term, the word must be said with the movement by all members, and all persons must participate fully

Point

Line

Line segment

Ray

Right angle lines are perpendicular and form a 90 degree angle.

Acute angle has an angle that is less than 90 degrees.

Obtuse angle has an angle that is more than 90 degrees.

Parallel lines are lines that are consistently equidistant and will never touch.

Perpendicular lines are lines that form 90 degree angles.

Fifth Grade– Throwing the Ball

5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

The teacher gives a soft ball to groups of 4. The students determine a wacky way to throw the ball back and forth. Example, encourage students to think of ideas like throwing the ball under their leg, over their head backwards, as fast as they can while standing very close, etc. Then 2 students throw the ball back and forth for 3 minutes. One of the other students is the counter and data collector and the other is the timer. The timer tells when 30 seconds is up and the counter writes down the number of throws for that 30 second interval. The students are counting themselves as they throw so the counter can pick up after the data has been written down. Then they start to count for the next 30 second interval, until they have completed six 30 second intervals. Then it is the turn of the counter and the timer to throw and collect their data. A data set may look something like this.

30 sec. Intervals	Number of throws in that 30 second time period	Total number of throws.
1	20	20
2	18	38
3	22	60
4	19	79
5	30	119
6	17	136

After the data is collected the students plot their points on a coordinate grid. Based on the data, they will need to determine the intervals of the y axis, give it a title, labels, etc. Also, they will need a key for two different colored lines since there will be one line for the first pair and one line for the second pair. Remember that time needs to go on the x axis and number of throws on the y axis. Then as a group, look at the different coordinate grids and determine why the lines are different. Why are some more steep? Why are others flatter? Do the lines ever go down or do they always go up? Why or why not? Is the line ever perfectly horizontal? Why or why not? What does the line indicate about the way the ball was thrown? How could you throw the ball if you wanted the line to appear a particular way? Could a game be created where you got a line that went up to the right and also down to the right?

Mathematical Ideas for Getting Students in TEAMS….

Count off by 5s - Those with an even number on one team and those with an odd number on the other team. If you want them in 4 groups, each of those 2 groups repeats the process.

Count off by 10s – Those with an even number in the tens digit are on one team and those with an odd number in the tens digit are on another team.