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8 Sample Activities: working together as a musical community to enhance mathematical learning

In my classroom, I have found using Music and Movement engages the students at a very high interest level. Using Music and Movement as tools to support understanding of curriculum concepts through positive social interaction, self-expression, providing opportunities for critical thinking and problem-solving, as well as purposeful fun!

If you were to visit our classroom, you would see students engaged in Active Learning Experiences that use Music and Movement in purposeful ways to enhance communication skills, language skills, mathematical understanding and music appreciation. Most impressively, you will see happy, smiling children totally engaged in their learning!

Some strategies that might be unique to our classroom, that are very easy to implement across the curriculum are listed below:

Steady Beat – Students engage in keeping the steady beat in nonlocomotor and locomotor ways (using foundational pedagogy of Phyllis S. Weikart and the late Dr. Edwin Gordon) as they listen to music, move to music, and sing.

Vocal Exploration – Students explore many ways they can use their voice in order to find, define, and refine their “singing voice”.

Random Pitch Singing – Students use their singing voice (in place of their speaking voice) to use language to describe, give directions, make plans, and converse with others. The use of the singing voice engages additional centers in the brain, making the experience more memorable and significant (not to mention expanding the vocal possibilities).

Neutral Syllable Singing - Students initially learn melodies, while keeping steady beat, on a neutral syllable before adding lyrics. This helps to build melodic focus without the added distraction of language. (Our brain will pull the focus away from the melody and to the language, so if we remove the language temporarily, the learner can focus without the added distraction. Also, for Second Language Learners, removing the lyrics to focus on the melody encourages total participation with the steady beat and the melody.)

Chime In - Students learn melodies and lyrics through “chiming in” on repeated phrases rather than echoing. Many students need the extra repetition so they can join in on what they can and build from there.

Anchor Beat – Leader synchronizes the movement in Steady Beat before adding singing.

Anchor Pitch – Leader sings the Anchor Beat using the beginning pitch of the song to establish a tonal center and give a starting pitch. “Beat, beat, Ready, Sing”

Acapella Singing - Students sing without accompaniment tracks and without recordings so that they can focus on melodic movement without the distractions of instrumentation. Singing without recorded music, also provides opportunities to take the song at an appropriate tempo for each individual group, change lyrics to make it their own, add students’ names, personalize the song to reflect student ideas.

Recorded music without lyrics is used to help focus students on finding and keeping steady beat.

Beat Before Rhythm - Students are working and securing the ability to independently find and keep the Steady Beat before rhythms are used in movement or playing. The lyrics bring the rhythm until the body can independently find and keep the Steady Beat. (Fewer than 30% entering Kindergarten can independently find and keep a Steady Beat to a recorded piece of music. This used to be a skill children could do upon entering Kindergarten. Unfortunately, it is no longer the norm.)

The above guidelines have been effective in building musical competence and in scaffolding simple to more complex musical learning, understanding and skills. These guidelines are a springboard to provide opportunities for children to grow musically and realize their creative potential because they are being set up for success by the use of specific strategies that build foundational skills on which later musical learning and all learning can be built.

Using these guidelines to steer my teaching has empowered me, as an educator, and my students as learners to use Music and Movement across the curriculum. We are not simply choosing songs to sing and coordinate with our curriculum, but are systematically building musical awareness and competence, while we simultaneously enrich learning across the curriculum and make connections.

The following activities are supporting the CA Math Standards for Kindergarten. I am submitting 8 sample activities that show the children working together as a musical community to enhance mathematical learning.

My hope is that these strategies can be used by other educators to help facilitate the realization of your goal of empowering youth to reach their full creative potential by providing teachers with tools to support their students as they embark on musical endeavors.

Attributes of Shapes

Children trace shapes and become aware of the attributes of the shapes, curved lines, straight lines, corners, angles, and build vocabulary using descriptive language about shapes.

Standards: Geometry K.G.2. Correctly name shapes regardless of their orientations or overall size.

Standards for Mathematical Practice:

MP.6. Attend to precision.

MP.7. Look for and make use of structure.

Materials:

Large felt, or laminated shapes (circles, squares, triangles- different kinds, rectangles - different kinds, hexagons, semicircles, etc.) depending on your floor surface.

Instrumental music with a steady beat, such as “Soldier’s Joy” on the CD for extensions –Rhythmically Moving #2, High/Scope Press

Movement and Music Concepts

Moving in locomotor ways

Moving in nonlocomotor ways

Movement in steady beat

Mathematical Concepts

Geometry-Describe attributes and parts of two dimensional shapes

Use visualization

Recognize geometric shapes and structures in the environment and specify their location

Step 1 Pre-K-grade 2

Children choose a shape and find an open space on the floor. Children explore attributes of the shape by tracing the outside edges of the shape using different body parts for instance, using the pointer finger, then the elbow, etc. Put extra shapes out on the floor for student use. Students go to a few more shapes to explore them also.

Step 2 Pre-K-grade 2

Children share what body parts they used to trace around their shape. Everyone traces their shape using the suggested body part. For example, someone may have suggested using their hands, so everyone tries with their hands, someone else may suggest their foot, so everyone tries with their foot. Other suggestions of students have been their ear, nose, chin, elbow, hip, etc.

Step 3 Pre-K-grade 2

Children are encouraged to talk about or sing (singing random pitches that go up and down and move melodically in random ways. This is encouraging the joyous use of song to express themselves in a musically appropriate way without the constraints of a predetermined melody. The children sing about what they notice as they trace the perimeter of their shape.) Encourage the use of terminology such as straight lines, curved lines, corners, angles, etc. The adult in the classroom could model what we could call “Random Pitch Singing” by using their singing voice as they give directions. They could also model by singing about what they noticed about a shape they explored. Children volunteers share something they noticed about their shape. Students use their “singing voice” as they tell about what they have noticed. The focus is not on the name of the shapes, although it is useful information and something we want the children to eventually be able to identify, but rather the focus is on the attributes of the shapes.

Step 4 Pre-K-grade 2

Children march to the steady beat of the instrumental selection. When the music stops, children find a shape, make a plan of what to use to trace the shape, and describe by singing about the attributes of that shape.

Step 5 Pre-K-grade 2

Children volunteer to tell something or sing about the new shape that they noticed as they traced it. Some may comment on the body part they used to do the tracing, the lines, the size of the shape, the color of the shape, etc. Encourage the use of complete sentences, supplying language and restating in complete sentences where needed.

Step 6 K-grade 2

Children tell or sing to someone near them lots of things that they noticed about their shape.

Step 7 Pre-K-grade 2

Repeat Steps 4 and 5 many times so that the children have many opportunities to describe the attributes of many shapes.

Step 8 Pre-K-grade 2

Children recall their original shape (from Step 1) and plan a way to travel "back home" to that original shape.

Step 9 K-grade 2

When they arrive "back home" to their original shape, encourage the children to compare the shape they just visited to the shape they call "home" by using their singing voice.

Encourage the use of complete sentences using comparative words. Ask for children to volunteer their comparisons. For example, "The blue shape I just visited had three straight sides and three corners, but my home shape is a circle with no straight lines."

Extensions:

Pre-K-grade 2

Children share things in the environment that are the same shape as the one they are tracing, such as a pizza can be the same shape as the circle.

K-grade 2

Children travel with a partner and play "My turn, your turn", in giving attributes about the shape they are tracing and describing through random pitch singing.

Children make up new plans to use such as changing the march to another movement, going to shapes with only straight sides, going to a shape that has something in common with their "home" shape, etc. Children may end up needing to share their shape with someone else (how important to work cooperatively and find things we have in common with others. Just another chance for positive interaction about curriculum concepts!)

Homework extensions

Find objects in the room that have the same attributes as one of the shapes you explored.

Find objects outside that have the same attributes as one of the shapes you explored.

Find objects at home that have the same attributes as one of the shapes you explored.

Facilitating questions

What attributes do you like best? Why?

What shapes shared the same attributes?

Dear Parents,

In class we have been working with attributes of shapes. We have used different body parts to trace around the shapes in our classroom. Some children used elbows, knees, and fingers. The children were very successful in talking and singing about the things they discovered such as a triangle has "three pointy corners" (we labeled those angles), and three straight lines (we named those straight sides). We discovered that a triangle is a triangle no matter what position because of the three sides and the three angles. The homework is finding shapes in your home. Illustrate and label 5 of these shapes. Please bring back this page tomorrow.

Sorting with a Song

Children will classify themselves in many ways: by color, clothes, height, etc. while singing an engaging song.

Standards

K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

Standards for Mathematical Practice

MP.2 Reason abstractly and quantitatively.

MP.6 Attend to precision.

MP.7 Look for and make use of structure.

Materials

Song: "Rig-a-jig-jig and Away We Go"

Song on CD in back of book

notation within the activity

Movement and Music Concepts

Moving in locomotor ways

Moving in steady beat

Math Curriculum Concepts

Sort, classify, and order objects according to their attributes

Count with understanding and recognize 'how many' in sets of objects

Steps to Success

Pre-grade 2

Children find a way to move about the space while the adult sings the first part of "Rig a Jig, jig" (As I was walking down the street.....") on a neutral syllable "bahm". When the song ends the children turn to a nearby child. They find something that they have alike, such as "We are both wearing jeans". The children volunteer to share their sentence with the group. Have the children choose a way to move, such as galloping while you sing the second part of the song, ("Rig a jig, jig and away we go.....") Repeat the process for as long as the children are focused.

K –grade 2

Students walk about the space while the adult sings the first part of the song "As I was walking down the street.....hi, ho, hi, ho, hi, ho." The children decide how they will be classified such as those wearing the same color shirt. There may be groups of one. Have the students count how many are in their group. Have each of them make a plan for how they will move through the space for the second part of the song "Rig a jig, jig and away we go.....") Repeat the process. Children will begin to 'chime' and sing the parts that they remember (usually the repeated phrases)

Grades 1-2

Children walk about the space while the adult sing the first part of the song "As I was walking down the street.....hi, ho, hi, ho, hi, ho." When the music stops a volunteer will choose an attribute such as children who are wearing blue. Only those wearing blue will move through the space on the second part of the song ("Rig a jig, jig and away we go....."). The rest of the children will stand still while the others move among/around them. This builds spatial awareness. Have the children count the number of children who are moving and how many are not moving. Convert this into an addition problem such as $10 + 12 = 22$ (the number of children in the class). Continue with another attribute. If children 'get stuck' on a single attribute such as color, you may need to ask, "What if it isn't a color?" Children will then brainstorm other attributes such as birthday month, those with a brother, etc.

Extensions

Keep a class list of all the classifications that they have discovered.

Take digital pictures of the children grouped together by attributes.

Graph the number of students who are wearing (blue) or who have a (brother).

"Sorting with a Song" (classifying)

Tune: "Rig a Jig Jig"

As I was walking down the street, down the street, down the street,
People **in blue** I chanced to meet, hi ho, hi ho, hi ho. (Now all wearing blue move about the space)
Rig a jig jig and away we go, away we go, away we go,
Rig a jig jig and away we go, hi ho, hi ho, hi ho!

Homework Extensions

Find things outside that you can sort such as the playground balls, fallen leaves, etc.

Find things at home that you can sort, such as your socks, books, toys, etc.

Homework

Dear Parents,

We have been working on sorting children by using attributes such as children wearing blue and children not wearing blue, sorting by all who share the same birthday month, etc. Find something at home that can be sorted such as toys, putting away the silverware in the drawer by forks, spoons, etc, helping sort the laundry by who it belongs to in the family, etc. Have your child write down what was sorted and what attributes were used and illustrate it.

Song with Positional Words (minor key)

Summary

Children use positional words to “Put Your Hands _____ of You” for the class to perform.

Standards K.G.1

Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

Standards for Mathematical Practice

MP.6 Attend to precision

MP.7 Look for and make use of structure

Materials

“Joshua Fought the Battle at Jerico” melody

Steps to Success

Pre-K-grade 2

Step 1

Children are in personal space, not in a circle.

“Watch and copy” and the teacher without talking puts her hands in front. The children copy and the question is asked, “Where did I put my hands?” The children respond with “in front of you’, ‘straight out from your waist’, ‘away from you’. All answers are correct.

Ask the children to put their hands somewhere else while they remain in personal space. Ask where they put them. They will all answer at once in conversational volume. Have them try several places.

Sidebar: Young children need to hear themselves speak the words to understand because the preoperational child does not have inner hearing.

Step 3

Ask for volunteers to show where they put their hands (in front, back, to the side, under, etc). As each child volunteers, everyone copies and then says where the hands are.

Step 4

“We are going to put your ideas into a song.” Ask for another volunteer. Alejandro puts his hands behind him and everyone copies. The teacher sings the song:

“Put your hands behind your back

Behind your back,

Behind your back,

Put your hands behind your back....

On the last phrase, “Then put them...” stop and ask for another volunteer.

Ichiro puts his hands up and says that they are over his head.

Everyone copies and the song is sung with “over your head”

Sidebar: If the child does not have the language for the position, the other children or the teacher can supply the words for what the child is doing. This encourages ELL students to participate in the activities, and reinforces the word that describes their position.

All children have an opportunity to be the leader.

Sidebar: Songs with repetitions give reinforcement of the words because they are sung several times.

Homework Extensions

Find something at home that is in front of your house or apartment.

Find other things at home that 'show' a positional word such as the plates and silverware are on the table.

Homework

Dear Parents,

Today we worked with positional words such as in front, in back, beside, under, etc.

Have your child get out an action figure or stuffed animal and see how many positional words they can use while playing with their toy, for instance, putting them under the bed, on the chair, beside them on the couch. Have your child draw a picture of what they did and have her/him tell you the positional words. Put the drawing in the homework bag.

Math at the Opera

Summary

Students create, act out, sing, and illustrate addition story problems.

Standard: K.OA.2.

Solve addition and subtraction word problems, and add and subtract within 10.

Standards for Mathematical Practice:

MP.1. Make sense of problems and persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3 Construct viable arguments and critique the reasoning of others.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision.

Materials

Paper and pencil, crayons, markers, or colored pencils for illustration

Math Curriculum Concepts

Recognize language that signifies “addition” in story problems. “more”, “all together”, “in all” “combined”, “put together” “made” “makes”, etc..

Steps to Success

Step One (Pre-grade 2)

Students create a simple addition story problem that they can retell. The adult might begin by singing, “Let’s tell a story about the fish we have in our tank. Once upon a time.....” the students begin to tell about the fish in the tank “there were 3 orange fish together swimming in the tank by the sunken treasure.” Then.....”Daniel sprinkled some food for them and the 2 black fish came over by the sunken treasure, too.” So, “Now how many fish in all are swimming by the sunken treasure?”

Step Two (Pre-Grade 2)

Students decide how they could show that story. Students choose who will be the 3 orange fish, the 2 black fish, where will the sunken treasure be?

Step Three (Pre-Grade 2)

Students act out the story with the teacher singing using random pitches and singing any notes that come, moving from high to low and low to high.

Step 4 Pre-Grade 2

Students sing and act out the story using their singing voice using random pitches. Everyone’s notes will be different, Everyone’s interpretation will differ, and the students will be retelling the story with their own words all at the same time.

Step Five (K-Grade 2)

Students represent the addition equation of $3+2=$ _____ on chart paper or a whiteboard.

Step Six (Pre-Grade 2)

Students solve the addition equation by counting the fish “by the sunken treasure”

Step Seven (Pre-Grade 2)

Students change character roles, change the numbers in the story, or the setting.

Step Eight (Grade 1-Grade 2)

Students in small groups write, direct, sing, and perform their own addition story problems as if they were at the opera.

Extensions

Students write, direct, sing, and perform their own subtraction stories.

Reflection and Cognitive Closure

What were some of the ways to insure your story was about addition? How did you recognize that others' stories were addition stories? What were some other concerns that came up as you were working with your group?

Dear Parents,

We are writing, directing, singing, and performing addition story problems as if we were in the opera. My homework tonight is to write and illustrate an addition story problem. I will be reading it to my class tomorrow and showing them my illustration.

How Many Are Hiding?

Summary

Children solve for a missing addend and represent the solution with a planned movement. Students use their singing voice to justify their problem solving rationale. All responses are given through the use of the singing voice on random pitches.

Standard: K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations,, expressions, or equations.

Standards for Mathematical Practice:

MP. 1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

Materials

Beans

Paper and pencil

Step One

5 children volunteers come up to the front of the group. The adult says that this is the “Game of 5”. The adult suggests that if everyone who is not a volunteer closes their eyes, when they open their eyes, some will not be in the front as they are presently. Some “will be hiding”. Students close their eyes and 2 volunteers duck behind a desk. The rest of the class opens their eyes and the remaining volunteers sing, “How many are hiding?”

Step Two

Adult asks children to share (using their singing voice on random pitches) what they think and how they came to their solution. Adult asks for more volunteers to share their strategies for solving the problem. Adult models singing, “Well, the game is 5, and we see 3, so that would mean that 2 would be hiding because.....” Three of the solutions might be: A. If we see three and we need to get to five, if I start at three and count on to get to five, I count 2 more numbers. B. I know that $3+2=5$ So if 3 are here, 2 are missing. C. If we started with 5 and three are still here, if you count backwards and take away 3, 2 are still left unaccounted for.

Adult writes $3+2=5$ on the whiteboard.

The missing addend was 2. Children make a movement plan to represent that solution.

The same volunteers play again, but this time the inverse number would be hiding (so 2 would hide to support and show the commutative property of addition $3+2=2+3$)

Step Three

Still playing the “Game of 5” 5 more volunteers come up. When everyone closes their eyes volunteers decide how many will be hiding this time. Children open their eyes and the remaining volunteers sing, “How many are hiding?”

Step Four

Children work through the problem solving strategies as noted in Step 2. It is not the “correct answer” that is important here, but the opportunities to share and articulate the problem solving strategies that the children are using to come up with a solution. Adult writes the equation on the whiteboard.

Children make a movement plan to represent the solution.

Step Five

Partners work with 5 beans playing “The Game of 5”. One holds the beans and disperses them so that some are hiding. The other child problem solves to arrive at a solution and represents the solution with their movement plan. Both students write each equation on their paper.

Step Six

Partners switch roles and play another round until all of the ways to make 5 are exhausted.

Step Seven

Adult introduces one more bean to the partners so they can play "The Game of 6".
This process continues as time allows.

Step Eight

Children gather to reflect on the strategies that they have been using. Adult writes the children's strategies on chart paper and posts in the room.

Facilitation and Reflection

What were the strategies that you used to solve for how many were hiding each time? What kind of patterns did you notice as you wrote down the equations? What else did you notice about solving for how many were hiding?

Extensions

Provide beans so students can play the game with 7, 8, 9, 10, etc.

Provide beans so that children can play when they have finished class work.

HW Provide beans and instructions so students can play the game with family members.

Dear Parents,

We are learning about problem solving in algebra. Your child has learned a number game called "How Many Are Hiding?" In playing this game together and taking turns being the leader, your child will be strengthening his addition skills, subtraction skills, order property awareness, logic and reasoning, communication skills, and memory! Wow! Have fun, and have your child record the equations that you work with as you play this game. Be sure that for each solution, the problem solving and reasoning is also described. Try to cover all of the combinations for making 6, 7, and 8. If you are up for a challenge, try the combinations for 9, and 10, too.

When Does.....?

Summary

Students use many different scenarios to support how $8-3=5$. Students use their singing voice on random pitches for verbal responses.

Standards K.OA.1

Represent addition and subtraction with objects, fingers, mental images, drawing, sounds, acting out situations, verbal explanations, expressions, or equations.

Standards for Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics

Materials

Variety of manipulatives and items from around the room to support $8-3=5$

Chart paper and markers

Construction paper and markers/crayons for students to represent through illustrations their data

Steps to Success

Grades K -2

Step 1

Adult begins discussion about when and where are numbers used? Brainstorm a list on chart paper. For example: time, money, counting, temperature, measurement, distance, volume, cooking, sewing, music, etc.

Step 2

Student partners choose which scenarios they are writing about.

Step 3

Students make up a story, sing it using Random Pitch Singing, and decide how they can "act it out".

Step 4

Students write their stories, find manipulatives to represent their stories, and represent their data on construction paper.

For example: There were 8 toys in a box. My brother took 3 out. How many are left?

It was 8 degrees outside. The temperature dropped another 3 degrees. What is the temperature now? I had \$8 to start with and received \$3 in change. How much did the ball cost? I had an 8' board and cut off 3'. How long is the other piece after the cut? In a board game, I'm on space 8 and have to go back 3 spaces. Where will I land? Skyler did 8 pull ups, which was 3 more than I did. How many did I do?

Reflection

How did you prove your answers?

What do you now know about the number 8?

Extensions

Students choose another equation to justify in many scenarios.

Children choose a number family to represent with 4 related equations, stories, and illustrations. For example the "Family 2, 3, 5" $2+3=5$, $3+2=5$, $5-2=3$, $5-3=2$

Homework Extensions

Dear parents,

We are finding that math happens all over the world in every area of our life. Tonight I am to write 6 short scenarios that support the equation $9-5=4$. I can include these numbers in stories about weather, speed, time, money, music, quantity, volume, cooking, calibration, measurement, shopping, etc.

The Ants Skip Count

Children begin by recognizing numbers in order, then out of order, and then by sets of 10's, 5's, and 2's. Precede this activity with "Skip Count Song"

Standards K.CC.1

Count to 100 by ones and by tens.

Standards for Mathematical Practice

MP.6 Attend to precision

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.

Materials

The Ants Skip Count Paper adding machine tape

Writing implements (e.g., markers or sidewalk chalk)

Step 1

Preschool-grade2

Children create a number line from 1-10, some may need adult assistance. (Paper number lines may be taped to the floor so they lie flat.) Sidewalk chalk can be used cement so that the student can walk down his or her line comfortably, one step per number. They may want to decide the spacing by using two of their foot lengths or two lengths of their hands. Children walk on the number line, saying out loud the number they are stepping on.

Step 2

Children choose another way to move on the number line, for instance 'jump', saying the number they landed on out loud. They may jump on any number in any order. They may 'skip over' some numbers.

Step 3

Have children share their way of moving on their number line and everyone tries that way of moving from number to number. The child may specify that everyone should go in order or the number that they call.

Step 4 K-grade 2

Ask each child to create a long number line from 1 to 20, drawing with markers on adding machine tape or drawing with chalk on the playground. (Paper number lines may be taped to the floor so they lie flat.) Numbers must be spaced out so each child can walk down his or her line comfortably, one step per number.

Step 4 K-grade 2

Children walk down along their number line, stepping on each number while counting out loud. Students work with a partner (sharing one number line walking on either side of it), synchronizing the timing of their steps and their counting.

Step 5 K-grade 2

Working by themselves, children walk along their own number line, stepping on every other number starting with 2. Children repeat this, this time skip counting out a loud by 2s as they step.

Step 6 K-grade 2

Working again with their partners, children step and skip count their number lines from 2 to 20, synchronizing their counting and stepping with their partners.

Step 7 K-grade 2

Ask one of the pairs to volunteer to set a steady beat; the group then skip counts from 2 to 20 to the beat. This is repeated with another pair setting the beat. You can suggest that the tempo be either a bit faster or a bit slower than the tempo of the previous pair.

Step 8 grades 1-2

Lead the children in synchronizing skip counting with the song *The Ants Skip Count* by following these steps: First, set a microbeat for the song by saying “MARCH, MARCH, MARCH, MARCH” as the children “SAY & DO.” {Sidebar for Learner Say & Do}

As students are marching, cue them by singing the beginning pitches of the song (sol and do) on a neutral syllable, for example, “Bahm, bahm, bahm, bahm, ready sing.” Then begin the song.

The Ants Skip Count

(To the tune of *When Johnny Comes Marching Home*)

The ants skip count by 2,

Hurrah, _____ hurrah! _____

The Ants skip count by 2,

Hurrah, _____, hurrah! _____

The ants skip count by 2,

Stop singing and pat to the macrobeat, chanting the following:

Beat, beat, ready, count:

2, 4, 6, 8, 10, 12, 14, 16, 18, 20.

Facilitation and Reflection

Do you like going in order on your number line or not in order? Why?

What do you now know about skip counting?

How did the number line help you?

How did using steady beat help you to skip count smoothly?

How did the song help you to remember the sequence?

Extensions

Students choose other numbers to skip count by, for example, counting by 5 to 50, or 10 to 100, following the same process with the number line.

Try it without the number line.

Encourage students to skip count by other numbers, counting by 3s or 7s, for example. Follow the same process with a number line.

Try it without the number line.

Homework Extensions

Find objects at home that you can skip count, for instance the pattern in the kitchen floor tiles. Where else can you find patterns to skip count? (the sidewalk squares, tile patterns at the grocery store)

Dear Parents,

In class we have been working with skip counting by 2's, 5's, and 10's. We used number lines and stepped starting with 2 we 'skipped over' 3 and stepped on 4, 'skipped over' 5 and stepped on 6 and continued this pattern to 20. We said only the numbers that we stepped on, "2,4,6,8,10,12,14,16,18,20". Find a pattern at home where they can skip count, such as the floor tiles in the kitchen. You may also choose to draw your own number line on the sidewalk with the enclosed chalk and skip count or draw the number lines on the enclosed adding machine tape to do your skip counting. Write down the one you chose to do, and write your skip counting from 2 to 20.

Graphing Voices

Summary

Children acting out well known stories have an extended opportunity to graph the sounds of the voices in the story. This activity uses the story “Brown Bear, Brown Bear” by Bill Martin.

Standards: K.MD.1

Describe measurable attributes of objects such as length or weight. Describe several measurable attributes of a single object.

Standards for Mathematical Practice

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision

MP.7 Look for and make use of structure.

Materials

“Brown Bear, Brown Bear” book

Chart paper or white board

Graph paper for the extension

Math Curriculum Concepts

Data

Graphing

Steps to Success

Pre-grade 2

Step One

Prerequisite: This is more successful when they know the story well.

Ask the children to tell who one their favorite characters is. They can either tell someone near them or simply answer out loud.

Sidebar *Young children do not have inner hearing and so need to talk out loud to hear their thinking. Using a normal volume is best.*

Have the children move around the space as if they were that character and add sound if they wish. When you say “stop sign” and they stop, have them share what they did with someone near them. They can either talk about it or show what they did.

Step Two

Ask someone to volunteer a character from the story and we all act it out. If they do not add sound, you will want to ask them to add the sound of the character after they have begun moving.

Ask what their body needed to do to be that character, such as I bent my arms and put my hands in my armpits for the wings of the yellow duck, another child might add I bent my knees to get shorter while I waddled.

Ask them to make the sound of the duck. Using your high voice ask, “Was it a really high sound?” Using your low voice ask, “Was it a really low sound?” Using your medium voice ask, “Was it somewhere in between?” They probably will answer somewhere in between.

You will already have a piece of chart paper or a section of white board with the word ‘high’ written at the top and the word ‘low’ written at the bottom. After the children respond, write on the chart paper or white board: ‘Yellow Duck’ somewhere in the middle of the space.

Repeat the process for as many characters as they would like to do, or you run out of time. The children may need to go back to one of the sounds already charted when they are deciding where to put the new sound on the chart.

Sidebar *We cannot see or touch our voice and so need concrete ways to begin to classify higher and lower sounds. It is easier for them to identify sounds that are farther apart on the spectrum.*

K –grade 2

Step three

Using the information from the chart, have the children decide how they would like to graph the information, for instance from lowest to highest; low voices, medium voices and high voices; size of animal, size or volume of voice, etc. This can be done in partners or small groups.

Have them count how many in each section of their graph and add that information to their graph.

Step four

Ask the children to explain their charts and what information they now have about the voices of the characters in the book. Compare and contrast the graphs and their information.

Reflection

How did the movement of the character help you with how the voice sounded?

Which one/s were highest? Lowest? Medium?

What other animals not in the book have high sounds, low sounds, medium sounds? How could we graph those?

Extensions

Use other familiar books that have a lot of characters from which to choose.

Graph Zoo animal voices after a field trip.

Graph human voices in their family.

Homework Extensions

Graph the voices of the animals in your neighborhood.

Homework

Dear Parents,

Today we used to graphs to show high, medium and low voices in the book “Brown Bear, Brown Bear” Please help me to find a book at home that has animals and let’s try out their voices together and discover if they are high, low or medium. I have graph paper to collect my data. Or I will get out some action figures or stuffed animals and we can speak as if we were that character and graph the results.