BIG IDEA: Learners collect, represent and analyze data to answer questions, solve problems and make predictions.

KEY LEARNING AREA (Subject): Mathematical Thinking and Expression

AGE LEVEL: Pre-Kindergarten

TITLE: Graphing with Blocks

ALIGNMENTS:

Learning Standards for Early Childhood:
Focus Standard: 2.6.5 Interpretation of data

Additional Standards addressed:
2.1.2 Represent numbers in equivalent forms
2.1.3 Concepts of numbers and relationships
2.1.6 Concepts and applications of operations
2.5.2 Communication
2.6.1 Collection of data
25.1.1 Self awareness
25.3.1 Trust
15.1.2 Risk taking
1.6.1 Discussion

VOCABULARY:
1. Tie: equal
2. Equal: having the same quantity
3. Longest: having the greatest length of many
4. Least: smallest in quantity or size
5. Most: the greatest amount

ESSENTIAL QUESTION:
1. What patterns can I observe and describe based on the data represented?

OBJECTIVES:
In this lesson learners will have an opportunity to draw conclusions based on data presented.
Learners will:
1. Identify their choice by placing a block in the correct category.
2. Use counting as a means for determining quantity.
3. Create a graph cooperatively with adult and other children.
4. Draw conclusions with adult guidance.
DURATION AND LOCATION:
15 minutes / whole group instruction

MATERIALS NEEDED:
- Chart paper
- Blocks (enough so each child can be represented)
- Marker (to record number data)
- Things I Like by Anthony Browne

INSTRUCTIONAL PROCEDURES (LARGE GROUP/CIRCLE TIME):
Prior to the lesson, create a graph. * See the example given in additional resources.
- Gather children into a large circle.
- Show the children the book Things I Like by Anthony Browne. Share the title of the book with the children and author/illustrator. If the title of the book is Things I Like, what do you think the story could be about? Allow children enough time to generate responses and discuss. Have the children think about things that they like to do.
- Read the book Things I Like by Anthony Browne and discuss/question along the way as opportunity deems fit. Now, I want you to think about some things that you like to do with friends? Who would like to share? Choose four of the favorites and add them to a pre-made graph. *See additional resources section below.
- We are going to collect some information in a fun way. So, what do you like to do with your friends? We now have four things listed here on this graph that you will get to choose from. 1. Ride a Bike. 2. Read a Book. 3. Build structures. 4. Draw or color. When I pull your name, you will get to place a block on your choice.
- Give each child a block ahead of time having them place it on the floor in front of them. Model the process by choosing what you (the teacher) like to do best with friends and place your block in the corresponding row.
- Pull children’s names one at a time and allow them to come up and place the block in their area of choice. Be sure that blocks are placed side by side one another, lining up. Stop along the way to note the patterns that are beginning to take place. Use this as an opportunity to introduce or reinforce vocabulary: tie, equal, longer, longest, shorter, shortest, most, least.
- Engage the children with counting the blocks in each row. Draw a line at the end of each row with a marker.
- O.k., think for a minute. Before we do anything we are going to take a look and see what do we like to do best? Look at the graph, I am going to count to 3 and we all are going to answer out loud. Ready, 1, 2, 3....
- If you said __________, raise your hand. You can tell because it is the “longest” one. Choose a child to come up and count one row/category of blocks. Choose another child to come up and write that number at the end of the row. Continue with all rows/categories.
- What do we like to do the least? What else do we like to do the least?
- Have the children observe the data in the graph and continue to draw conclusions about the patterns they have noticed.

HIGHER ORDER THINKING/INQUIRY QUESTIONS:
1. What do all of the blocks represent/mean on this graph?
2. What does this graph tell us?
3. Why is it important that everyone gets to make a choice?
4. What would happen if someone didn’t get a turn?

FORMATIVE ASSESSMENT:
- How can we tell which activity the class liked to do best?
- How can we tell which activity the class liked to do least?
- What does the word tie mean
SUGGESTED INSTRUCTIONAL STRATEGIES:
To Motivate Students: Engage children’s attention by having them designate their choice using a block.

To Individualize Instruction (differentiate): Take into consideration anyone with a visual limitation and place them as close to the graph as possible. Be sure to verbally express the steps and results of the graphing along the way. For those children they may not grasp this concept in a large group setting, provide further one-on-one exploration during work time/center time with staff.

To Apply what they have learned: Allow the children to engage in open discussion regarding the observations they make.

To: Extend what they have learned: Place graphing opportunities (either teacher made or store bought) in the math area to allow children further practice, deepening their understanding of comparing data

SUGGESTED INSTRUCTIONAL STRATEGIES:
Refer to the WHERE TO explanation sheet to better understand this section of the lesson.

RELATED RESOURCES:

Across the Curriculum
(How will you incorporate the topic throughout your interest areas)

<table>
<thead>
<tr>
<th>CREATIVE THINKING &amp; EXPRESSION</th>
<th>Art</th>
<th>Open up the easel for painting. Suggest children paint pictures of their favorite things. (9.1c.1; 10.5.2)</th>
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<tbody>
<tr>
<td>Blocks</td>
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<td>Have children build towers that have more, less or the same number of blocks as a given model. (2.2.2; 2.3.2)</td>
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<tr>
<td>Music</td>
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<td>Play an alternate version of musical chairs and call it “Which center am I in?” Play music for the children and encourage them to dance around the room. When the music stops, they are to freeze. Tally the number of children that are in each center and have students draw conclusions from the data. (2.6.1; 2.6.5; 9.1a.1)</td>
</tr>
<tr>
<td>LANGUAGE AND LITERACY DEVELOPMENT</td>
<td>Encourage children to draw and write what their favorite thing to do with a friend was. Transcribe children’s spoken language to print. Create a class book entitled “What we like to do with our friends” and place it in the reading/library area for children to look at. (9.1b.1; 1.4.1; 1.4.2)</td>
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<tr>
<td>MAtHEMATICAL THINKING AND EXPRESSION</td>
<td>Offer graphing opportunities with hands on materials in the math area. (2.6.1; 2.6.5)</td>
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<tr>
<td>HEALTH, WELLNESS AND</td>
<td>Encourage children to play their favorite games with their friends. (10.4.1; 10.4.3;</td>
<td></td>
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<tr>
<td>PHYSICAL DEVELOPMENT</td>
<td>25.4.1; 25.4.2</td>
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<td>- After eating, have the children look at all the plates on the table before they are thrown away and draw some conclusions about what the favorite food was? What the least favorite food was? How did they decide this? (2.6.1; 2.6.2; 2.6.5)</td>
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<thead>
<tr>
<th>Ride a bike</th>
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<tbody>
<tr>
<td>Read a book</td>
<td><img src="image" alt="Book Club" /></td>
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<tr>
<td>Build structures</td>
<td><img src="image" alt="Build" /></td>
</tr>
<tr>
<td>Draw or paint</td>
<td><img src="image" alt="Crayons" /></td>
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