Mathematics: The Language of STEM

What do we know about Kindergarten, First Grade, and Second Grade Students at Leesburg Elementary?

Treleen Cox

CONTENT AND TASK DECISIONS

Grade Level(s): 2nd

Description of the Task: Students will gather data from K, 1st, and 2nd grade teachers or students about students here at Leesburg. After gathering data students will create a bar graph representing the data and create posters to be displayed.

Indiana Mathematics Content Standards: 2.DA.1 Draw a picture graph (with single-unit scale) and a bar graph (with single-unit scale) to represent a data set with up to four choices (What is your favorite color? Red, blue, yellow, green). Solve simple put together, take-apart, and compare problems using information presented in the graphs.

Indiana Mathematics Process Standards: PS.4: Model with mathematics

Mathematics Content Goals: Students will be able to graph data to represent information gathered from K-2 classrooms.

Language Objectives: Students will create valid questions to use when gathering data.

Materials: index cards, poster board, colored pencils, paper

THE LESSON

Before: Students will gather information about classmates so we can create class graphs.
Worksheet with questions to be answered:

1. How old are you 6, 7, 8, or 9?
2. What is your favorite animal cat, dog, bird, or fish?

Activate prior knowledge (including the specific questions you will ask to raise students' curiosity and activate or determine their prior knowledge),

- **Be sure the problem is understood,**
  - Students will be asked two questions (How old are you and What is your favorite animal?)
    - Each table group will be asked to write down the answers in their math journals and decide how to share it with the class.
    - After each group shares, the following question will be proposed to the group
      - How can we display this information for others to understand?
    - Class will discuss ideas and teacher will ask questions to encourage students to mention graphs
      - What problems do we see with the data we collected from each group?
      - How can we make the data easy to display for others?
      - What kind of graphs can be used to display this information?

- **Establish clear expectations**
    - Students will have a Keynote presentation that will propose the big project.
        - How can we gather data to display information about students in Kindergarten, First Grade, and Second Grade here at Leesburg?
        - What did we learn when we created a graph of data in our class?
        - What important information should we include in our data gathering pages?

During: Students will be going to separate classes to gather data for creating graphs. Teachers will be asked ahead of time about students coming into their rooms at specific times to ask students the following questions. If teachers prefer they can explain the questions ahead of time so their students are prepared to answer by raising hands. The second graders can do tally marks when hands are raised. If a teacher is okay with students going into the room and asking students one on one we will do that as a class. This portion will need to be done according to the flexibility of teachers. The ideal situation would be our class going to Kindergarten Hallway at a given time and send in 6 students to each class to gather the data and I can float between the three classes. This can be repeated in First Grade Hall and with the other two Second Grade classes. I will be proposing this project with the other two teachers in second grade and if possible each class gathers the data for one class in each grade and we share the data to create a display as a grade level. *We have done a Science project like this and it went well so I am confident it can work again.

- **Let go-**take data worksheet to classes and ask questions to other students
- **Listen actively-**students will return to class and put data on one chart for each grade level, working together they will discuss if their poster will be a picture graph or a bar graph
- **Provide appropriate support** – Students will have poster boards to create a graph to display the information gathered.
    - Why did you choose a ____ graph to display your data**?**
    - What will be the title for your graph?
    - How will your group decide who will draw the graph and who will input the data?
    - What did you learn from the graph?
- **Provide worthwhile extensions**.
    - Students who finish early can brainstorm ideas in their math journal for the next graph they would like to create.
    - Graphing Game

After: Student groups will display their poster and share with the class why they chose to display their data with that specific graph. (picture or bar)

- **Promote a mathematical community of learners**
    - Each student in the group will share with the class (four per group)
        - We chose to display our data with a (picture/bar) graph because _____.
        - This graph tells us that _____.
        - Our team worked well together when _____.
        - We learned that students at Leesburg _____.
- **Listen actively without evaluation**
    - Students will receive a evaluation sheet for their group.
- **Make connections** – see questions throughout the lesson
- **Summarize main ideas** Students will be writing in their journals throughout the process and that will be a great assessment for understanding the main idea.

ASSESSMENT

Observe: Students will be recording data in their journal, worksheets, and on a poster board. Students will share their graph with the class as a culmination of the lessons.

Ask: List the specific questions you will ask students to assess their learning.

How can we gather data to display information about students in Kindergarten, First Grade, and Second Grade here at Leesburg?
What did we learn when we created a graph of data in our class?
What important information should we include in our data gathering pages?

- Why did you choose a ____ graph to display your data**?**
- What will be the title for your graph?
- How will your group decide who will draw the graph and who will input the data?
- What did you learn from the graph?