Lesson Plan Template

Subject: Math

Lesson/s: Line Plots

Dates: 6/19/07

Teacher: Ms. Abrams

Class: 3rd (Students have been grouped according to readiness level. All students were pretested at the start of the graphing unit and separated into three groups. This group is working at grade level.)

Time: 45 minutes

Key Question/s:

- Why do we use graphs?

Teaching Objectives:

Students will **<u>know</u>** …

- Parts of a line plot: title, key, axis (horizontal line), label, scale, plots, data, observation

Students will **<u>understand</u>** …

- Graphs can be used to organize and visually represent information or data in a more meaningful way.

Students will **<u>be able to do</u>** …

- Identify a line plot
- Collect and organize data on a given topic
- Create a line plot using data
- Read a line plot

Curriculum Framework:

Everyday Mathematics
Unit 2:Using Numbers & Organizing Data

- 2.5 Organizing and Displaying Data
- 2.8 Displaying Data with a Line Graph

State Standards:

(3.21)The student, given grid paper, will

- collect and organize data on a given topic of his/her choice, using observations, measurements, surveys, or experiments; and
- construct a line plot, a picture graph, or a bar graph to represent the results. Each graph will include an appropriate title and key

Evidence of Achievement:

As a result of instruction, students will be able to …

- Collect data and organize data on a line plot
- Construct a line plot on graph paper with a title, key, axis (horizontal line), label, and plots
- Analyze and interpret information from a line plot by answering questions
- Create additional questions to ask using line plot

Resources/Materials:

- Chalkboard
- Chalk
- Sticky notes
- Grid paper for students
- Rulers
- Markers
- Line plot worksheets for homework assignment

Keywords:

- line plot
- graph
- data
- axis
- plot
- key

Introduction:

- Invite students to come to the story circle.
- Ask students, "Can anyone remind me of the types of graphs we have been studying in math?" Make list on board. "Why do you think we use graphs? What do they help us to do?" Tell students "Today we are going to be learning about a new type of graph called a line plot. And, by the end of the day you are going to be able to create your own line plots and explain why we might use a line plot instead of a bar graph."
- Post examples of line plots on the board. Ask students, "What do you notice about these graphs? How are they similar to bar graphs? How are they different?"
- Tell students, "Before we start learning more about line graphs, we are going to read a story about a young girl who used to think her name was perfect. But on the first day of school, she begins to suspect that her name is far less than perfect."
- Read aloud – Chrysanthemum by Kevin Henkes
- At the conclusion of the story ask students "Why did Chrysanthemum not like her name?" Remind students how Victoria announces that Chrysanthemum's name has 13 letters. "That's half the letters in the alphabet!"
- Ask students "Can anyone think of any other extraordinary names like Chrysanthemum?" (e.g., John Jacob Jinglehiemer Schmidt, Marmaduke, Alice in Wonderland)

Activities:

Introduction new material:

- Tell students, "Before we make our line plot, we need some kind of data to collect. We collected data on the types of fruits for our pictograph and the color of M&M's for our bar graph. Now, after reading Chrysanthemum, I thought it might be interesting to collect data on the number of letters in your first names."
- Distribute sticky notes to students and have each of them write his/her name and the number of letters in his/her first name. Teachers and volunteers will also participate to get more variety. Tell students "Put both of your thumbs up on your desk when you are done."
- Draw a number line on the chalkboard. Explain to students that line plots only have horizontal lines, and compare it with bar graphs having both horizontal and vertical lines. Explain to students about arrows – "The arrows mean that the line goes on forever, but we only focus on the numbers we'll be working with from our data." Use this explanation as segue to the next step in the activity.
- Explain to students "So for our data collection, we want to find out the different numbers of letters that are in our first names." Gather data from students by asking and selecting volunteers to give the number of letters in his/her first names. Make sure to also ask "Is there anyone with less than four letters in their first name? Is there anyone with more than seven letters in their first name?" Write the smallest number (4) and the largest number (7) on the number line, and fill in the rest of the numbers in between (5 and 6). "If we were going to plot Chrysanthemum's name, how high would we need to go?"
- Ask students, "What should we label our horizontal line?" If students are having a hard time, ask them "What were we looking for in our data?" Label the horizontal line, *Number of Letters in First Name* for students to see.
- Have students, teachers, and volunteers place their sticky notes above the corresponding data point on the number line.
- To show students how an X (plot) is used to represent data on a line plot, as an example, replace one sticky note with an X. Explain to students that each X represents 1 person, and remind students that the numbers on the number line represent the number of letters in a first name. Make a key at the bottom of the graph X=1 person.
- Once all of the stickies have been replaced with X's, ask students questions about the data on the line plot.
    - "How many people in the classroom have six letters in their first names?"
    - "How many people in the classroom have the most letters in their first names?"
    - "How many people in the classroom have the least letters in their first names?"
    - "How many people in the classroom have five letters in their first names than people in the classroom with seven letters in their first names?"
    - "How many people in the classroom have six letters or more letters in their first

names?"
    - "How many people in the classroom have five or less letters in their first names?"
    - "_____ and _____ have the most letters in their first names? How many letters are in their first names?"

Practice:

- Distribute grid paper, rulers, and markers to students.
- Write down two important directions on the board, asking students to *Create a key: Each X represents ___ person*, and asking students to *Give the line plot a title*
- Before creating a line plot, explain the directions to students. Tell them that they will use the grid paper to create a line plot. Tell students that they need to collect data and they are going to use the names of at least six characters in a book they are reading. They may select the book and the characters. Students will collect the names and number of letters in each characters name on their data collection sheet. Tell students "Remember that when you make your graph, you will be putting X's (plots) on your grid paper." Then direct students' attention to the two directions on the board, and tell them they will need to put a title and key on their line plot. Assist students as needed during this activity. Make sure to tell students "Please raise your hands if you need help."
- For students who finish early, have them create three questions they would like to ask using the line plot and have them trade off with partners.

Closure:

- At the conclusion of the lesson students will take out their "Graphing is Great" journal and complete an entry on line plots. Remind students that they will be able to use their journal during their graphing quiz at the end of the week. Remind them to include information they think is important to remember about line plots. They may draw pictures or write about line plots.
- As students return to base classrooms have them drop feedback slips in the comments/suggestions box, giving students an opportunity to share their thoughts on the lesson and their comfort level with the content. Remind them that their feedback will help to shape future lessons.

Additional Support:

- There will be a classroom teacher, a teacher's assistant, and two volunteers to assist students during this lesson.
- Poster of completed line plot with parts labeled will be hung on the board.
- For students who are struggling with the practice portion of the task, the teacher's assistant will be creating a line plot for the characters in *Chrysanthemum* in the front of the room.

Extension Activities:

Computer games bookmarked on our Math Porta Portal site:

Create a Graph
http://nces.ed.gov/nceskids/createagraph/

Data Picking
http://www.bbc.co.uk/education/mathsfile/shockwave/games/datapick.html

Evaluation:

- As student leave for lunch have them hand in completed line plots. Check plots of accuracy.
- Journal entries
- Homework will be collected and checked for accuracy.
- Entry slip worksheet handed out at start of next math class on line plots.
- Data from above four sources will be used to group students for next lesson on line plots.

Homework:

- Line plot worksheet
- Plot the number of letters in the names of each member of your family.
- Compare three types of graphs we have used so far (bar, line, pictograph). What are the similarities? Differences?