



Cumberland County Schools

Objective 4.01 – Circle Graphs

Lesson Title: Circle the wagons! It's time to make a graph!
Curriculum Area: Mathematics
Grade: Third
Time: 60 minutes

I. PLAN

A. NCSCS Goal 4:

The learner will understand and use data and simple probability concepts.

B. NCSCS Objective:

4.01: Collect, organize, and display data (including circle graphs and tables) to solve problems.

C. CCS Task Analysis:

TLW: Collect, organize, record, and interpret information from class experiments or surveys and create an appropriate graphic display.

TLW: Define and identify graphs: circle graphs.

TLW: Interpret information from a circle graph.

D. CCS Pacing Guide:

Quarter: Second

Week(s): 1-2

E. Lesson Background:

Strand: Data Analysis and Probability

Marzano Level: Analyzing

F. Materials:

- Story: *The Grizzly Gazette* by Stuart J. Murphy
- Math journal
- White board
- Plastic bucket with four different colors of yarn balls (suggested: red, yellow, green, and blue)
- Chart paper cut into one-inch strips to form strips of squares
- Chart paper containing graphing information (see Attachment A)
- Crayons matching colors of yarn for graph and individual students (suggested: red, yellow, green, and blue)
- Paper containing circle (see Attachment A)
- Speech bubble pattern (see Attachment B)
- Sample tables and line plots (see Attachment C)
- The Graph Club or Excel
- Construction paper
- Vocabulary review chart (see Attachments D and E)

G. Prerequisite Skills:

- Displaying data using line plots
- Collecting data

H. Essential Question(s):

- How can students use data collecting skills to display data in a circle graph format?

II. IMPLEMENT

A. Anticipatory Set:

The teacher will group the students together for a read aloud of the story *The Grizzly Gazette*. After the story, the teacher will flip through the pages and draw the students' attention to the circle graphs in the story. He/she will then discuss how the graph changes each time the votes change. The teacher will inform the students that they will be collecting data to make their own circle graphs.

B. Teacher Input:

Using the chart paper (which is set up as a line plot), the teacher will graph the students' favorite ice cream flavors by marking an "X" with the crayon that matches the flavor of each student's choice. Suggested flavors/colors are red for strawberry, yellow for vanilla, green for chocolate, and blue for other. While recording the data, the teacher will "think aloud" to ensure that students understand the process of collecting and recording information on a line plot.

Rehearsal: Numbered Heads Together, Math Journal, and White Board

Students will work in groups of four and each group will have numbered off (1-4). The teacher will pose a problem related to the line plot graph previously completed. All students will privately write the answer in their math journal. Students will put their heads together, show answers, discuss, and teach. They will sit down when everyone knows the answer or has something to share. The teacher will then call a number. The students from each team with that number will answer simultaneously, using a white board. Teammates will celebrate with the students who responded.

Sample questions for line plot:

- What ice cream flavor is the class favorite?
- What ice cream flavor does the class like the least?
- How many students chose vanilla as a favorite?
- How many more students chose chocolate than vanilla?

Teacher Input: (Attachment D) Plastic Bucket with Colored Yarn Strips

The teacher will direct the students into groups of their favorite ice cream flavors. Each group will join hands to form a human circle graph displaying the results of the line plot. The teacher will take yarn from the bucket placed in the middle of the human circle graph and stretch out a string of each coordinating color to show the division of data choices in the human circle graphs. The teacher will explain that this is called a circle graph and this circle graph is displaying the same data collected and displayed in the line plot. After the students return to their seats, the teacher will continue by saying, "We just finished creating a human circle graph and today we are going to use data to create many different circle graphs. Before we continue, we need to review the important vocabulary." The teacher will write the vocabulary word listed below on the board or overhead for the students to copy onto their vocabulary word web (Attachment D). As the teacher writes, she/he orally reads the words aloud to the students. The students write the terms and definitions at the same time that the teacher writes them. (Adding these terms to a word wall would further enhance the learning).

- **circle graph** – a representation of data using a circle and sectors to represent, visually, the relative portion of the data in a given category

Rehearsal: (Attachment D) Pairs Practice

Students will work in pairs. Student A will say the vocabulary word, tell the definition, and give a synonym. Then Student B will say the vocabulary word, tell the definition, and use the word in a sentence. As a class check, the teacher will have all of the students draw a visual representation of a circle graph in the last portion of the vocabulary word web.

Teacher Input: One-Inch Squares

"Just a moment ago, we took the information from our class line plot and created a circle graph using the same data. We created a human circle graph where each person stood in the circle to represent his or her ice cream choice. I can also use these strips of paper to create a circle graph which also shows the ice cream data we collected." The teacher will model the first step of the process of taking the information from the line plot and transferring it to the strips of chart paper. Each block on the chart paper will color coordinate to the line plot. For example, you have three red votes for strawberry, so the students will color three red squares on their strip of paper.

Teacher Input: (One-Inch Squares) RallyCoach

Each student will gather the appropriate number of squares needed to recreate the data from the class ice cream survey. Students will work in pairs to check the work of their partner. Student A will show the squares and explain the correspondence to the line plot graph. Student B will check, coach if needed, and celebrate. Student B will then show his/her squares and explain the correspondence with the line graph. Student A will check, coach if needed, and celebrate.

Teacher Input: One-Inch Squares and Tape

The teacher will state that the data on the strips of paper represent the data on the line plot. He/she will then model taping together the ends of each strip to form a circle. The teacher will show the students how to lay their paper strip circle on the blank circle and draw the pie divisions that represent each wedge.

Rehearsal: (One-Inch Squares and Tape) RallyCoach

The students will complete their graphs by taping the squares together. Then they will transfer the data from their paper strip circle to the blank circle sheet, adding the divisions of the graph. The students will continue to work in pairs. Student B will explain the process of creating a circle graph to Student A. Student A will confirm, coach if needed, and celebrate. Student A will then explain the process of creating a circle graph to Student B. Student B will confirm, coach, and celebrate.

C. Guided Practice: (Attachment B and Math Journal) RallyCoach

The students will use the speech bubble pattern to explain, in writing, the information that the graph displays to them. This is called making the graph “talk.” Student A will read his/her speech bubble to Student B. Student B will confirm, coach if needed, and celebrate. Student B will read his/her speech bubble to Student A. Student A will confirm, coach if needed, and celebrate.

D. Closure: White Board

The teacher will display another line plot of data, and the students will silently create a human circle graph. While in the second human circle graph, the teacher will ask students questions pertaining to the data represented. The teacher will have students compare and contrast the line plot displayed with the human circle graph. After each question, the students will record their answer on the white board so the teacher may monitor student understanding.

**E. Independent Practice:
Differentiated Assignment:****Advanced Learners: Attachments B and C**

The students will work in groups of four to create a poster size circle graph from line plots given to each group. Groups will make their circle graphs talk using a speech bubble. After creating the circle graph, students will develop a survey to conduct with another grade level. This data will then be put into a table and two other graphs in a computer graphing program such as The Graph Club.

Proficient Learners: Attachments B and C

The students will work in groups of four to create a poster size circle graph from line plots given to each group. Groups will make their circle graphs talk using a speech bubble.

Strategic Learners: Attachment C

Students will work with a partner to create a circle graph with information from a given table. The circle graph will be created using a computer graphing program. Each student will write two sentences describing the data displayed in the graph.

Intensive Learners: Attachment C

Students will work with a partner to create a circle graph with information from a given table. The students will create the circle graph using unifix cubes and then copy the graph onto a sheet of construction paper. Each student will write two sentences describing the data displayed in the graph.

III. ASSESS:

- A. Products:**
- B. Diagnostic (see background):**
- C. Pre-Assessment:**
- D. Post Assessment (EOG format plus 2 open-ended)**

IV: RESOURCES:

- A. Websites:**
- B. Materials:**
- C. Professional Development Opportunities:**

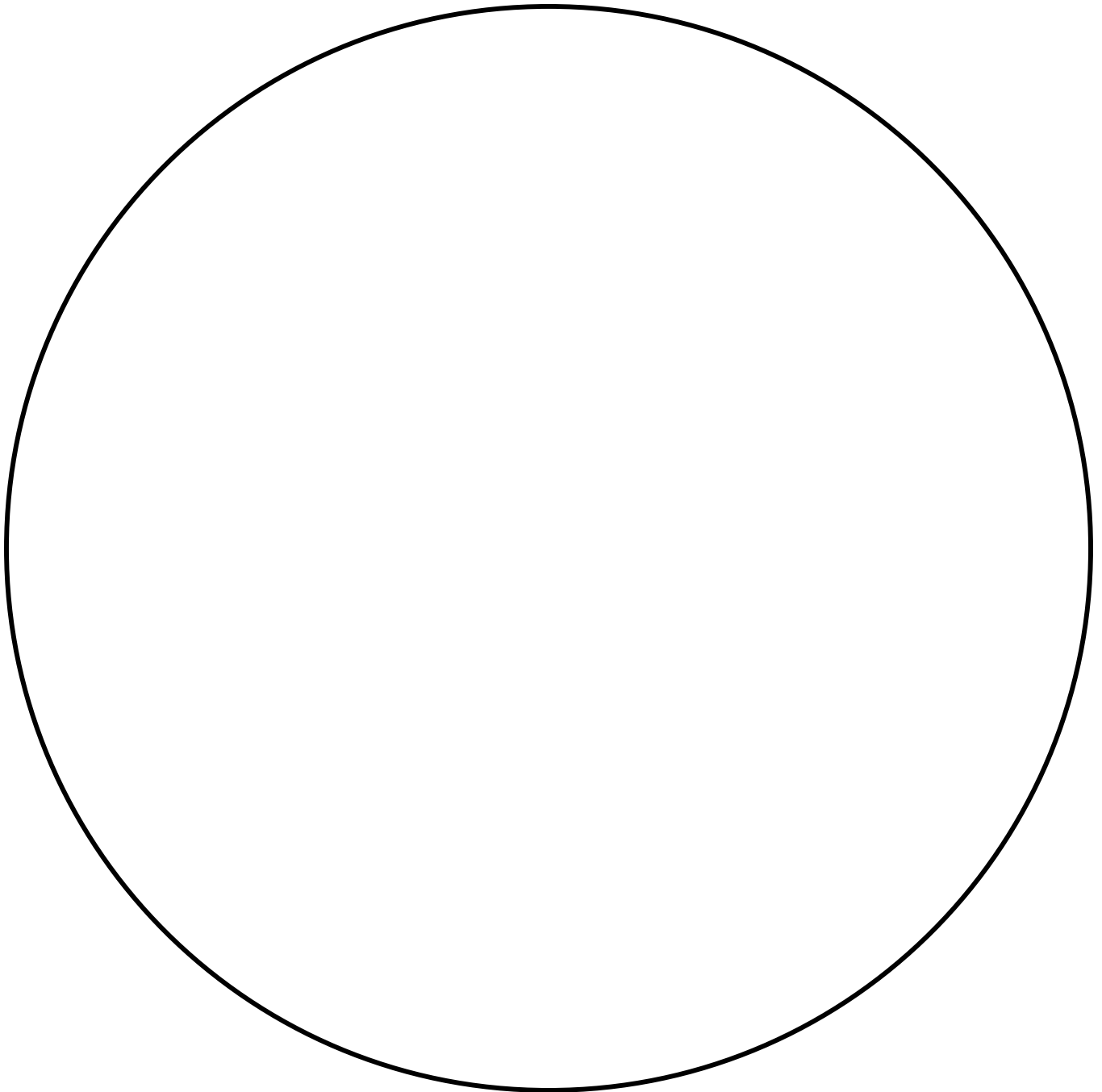
Favorite Flavors of Ice Cream

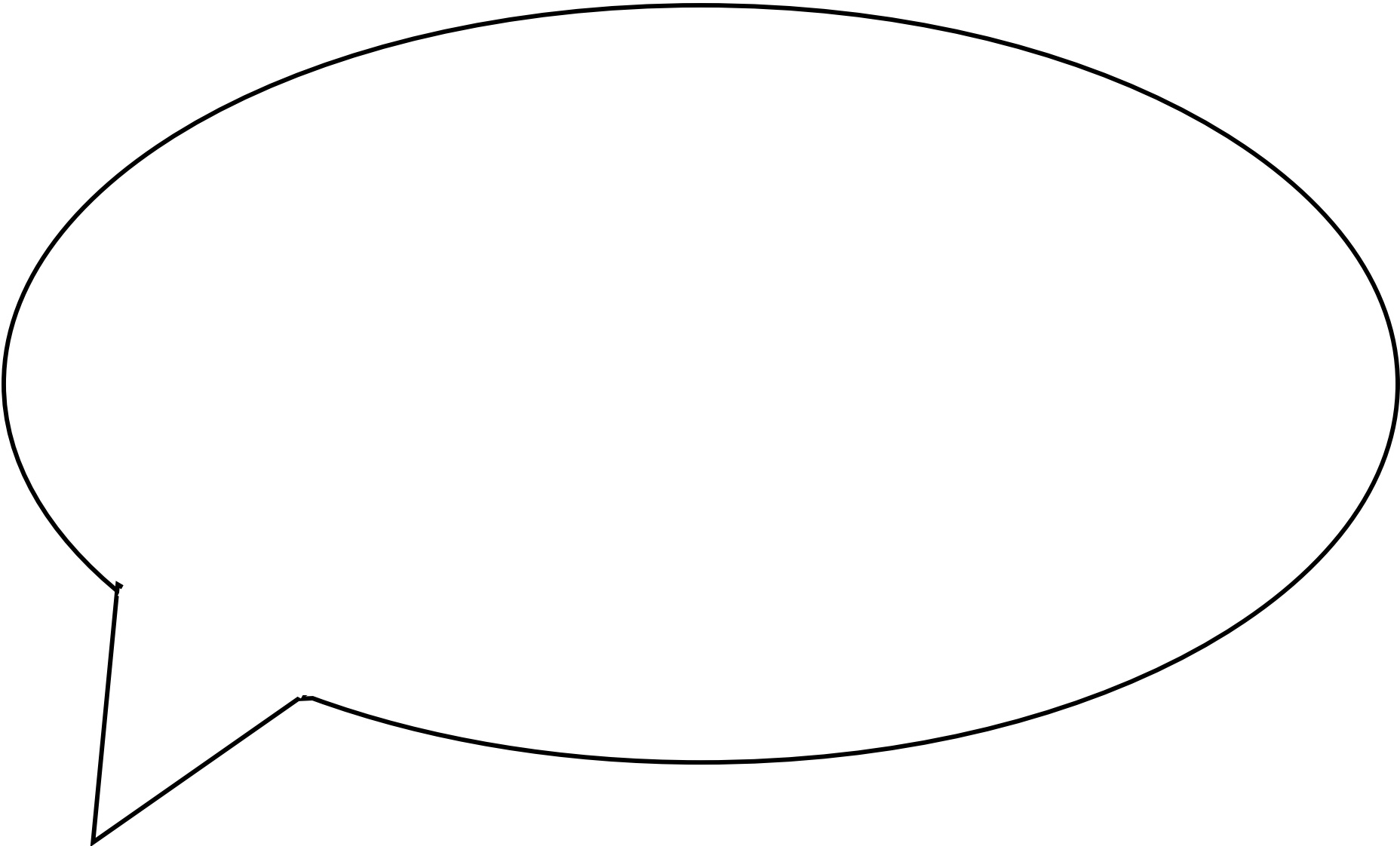
Vanilla

Strawberry

Chocolate

Other





Favorite Pet

Dog	5
Cat	6
Fish	4

Sports we like to play

Soccer	10
Baseball	4
Basketball	6
Football	5

Books we have read each month

June	15
July	17
August	8

Favorite Pizza Crust

	X
	X
X	X
X	X
X	X
X	X
X	X
Thick	Thin

Color of Our Eyes

X			
X		X	
X	X	X	X
X	X	X	X
X	X	X	X
Blue	Brown	Green	Hazel

