Lesson Plan Title: Fast Food Survey Using Bar Graphs

Local School District: Western Local School District

Grade Level: 2nd Grade

Subject Area: Math/Language

Teacher Name: Heather Thompson

Estimated Total Time: 250 minutes
Daily Time Allocation: 50 minutes
Number of Days: 5 days

Goal: The overall goals are to gather information and make interpretations.

Students will be able to do the following:

- Conduct a survey and sort data according to categories.
- Construct a bar graph with intervals of 1.
- Write a few sentences (facts, comparisons) about their graphs.

Outcomes:

Students will create a bar graph to pictorially represent the data collected from a survey. Students will use Excel® Spreadsheets to electronically create the graphs and data tallies.

National Standards:

NCTM (http://standards.nctm.org/document/index.htm)
Instructional programs from prekindergarten through Grade 12 should enable all students to:

- Create and use representations to organize, record, and communicate mathematical ideas.
- Select, apply, and translate among mathematical representations to solve problems.
- Use representations to model and interpret physical, social, and mathematical phenomena.
International Society for Teacher Educators (ISTE)
Performance Indicators For Technology—Literate Students (NETS)
(http://cnets.iste.org/students/s_profile-912.html)

Prior to completion of Grade 2, students will:

• Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies. (Basic operations and concepts.)

• Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (Technology productivity tools, technology communications tools, technology research tools, technology problem-solving and decision-making tools.)

• Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom. (Social, ethical, and human issues.)

Ohio Standards Connections:

Data Analysis and Probability:
Indicator 1 -3: Display data in picture graphs with units of 1 and bar graphs with intervals of 1.
Indicator: 1 -7: Answer questions about the number of objects represented in a picture graph, bar graph, or table graph (e.g., category with most, how many more in a category compared to another, how many altogether in two categories).
Indicator 2-1: Pose questions, use observations, interviews, and surveys to collect data, and organize data in charts, picture graphs, and bar graphs.
Indicator: 2-2: Read, interpret, and make comparisons and predictions from data represented in charts, line plots, picture graphs, and bar graphs.
Indicator 2-4: Write a few sentences to describe and compare categories of data represented in a chart or graph, and make statements about the data as a whole.

Writing Applications:
Indicator 2-4: Produce informal writings for various purposes.

Acquisition of Vocabulary:
Grades K-3, A: Use context clues to determine the meaning of new vocabulary.
Grades K-3, D: Know the meaning of specialized vocabulary by applying knowledge of word parts, relationships, and meanings.
Lesson Summary:

Preassessment:
• Whole-group instruction:
  1. Make a chart of the essential components of a bar graph.

Scoring Criteria: Teacher Observation and discussion

Postassessment:
  1. Students will work in small groups to apply what they have learned to construct their own bar graph after collecting results of self-generated survey.
  2. Quiz.

Material and Resources:

- Fast Food Survey
- Fast Food Survey tally sheets
- Survey papers (enough for every student in the class)
- Copies of blank one-inch graph (grid) paper (One for each student in your class)
- Projector
- Post-it® notes
- Writing paper (One for each group)
- Giant butcher or bulletin board paper
- Markers or crayons
- Pencils
- One bar graph example
- Chart paper
- Chart markers

Procedures:

Session 1:
  1. Using a computer and a projector, open MS Word®.
  2. Open the file “Fast Food Survey.”
  3. Note that there are boxes over certain words.
  4. Read aloud the words they can see together.
  5. Make guesses as to what the words might be under the squares.
  6. Type three responses at the end of the document or have students write on paper.
  7. Reveal each word a sentence at a time by clicking on each box and pressing the delete key.
    *Students love guessing the word and they are also using context clues.*
  8. Discuss with students that they will be taking their own “Fast Food Survey” of the second graders in our school.
  9. Show them the form they will use to collect that information.
  10. Display a bar graph that the class has already made (e.g., birthday graph, apple graph).
11. Have the students work at their table discussing what they notice about a bar graph.

12. Write responses on chart paper in a list format. (You may keep this posted and if students do not complete all components, you may add to it later.)

13. Explain that they will use the numbers (data) they collect from their survey to create a similar bar graph.

*Students should have seen and worked with bar graphs to some extent before now.*

**Session 2:**

1. Students will first conduct the survey in their classroom.
2. Distribute surveys to each student.
3. Students should survey each member of the classroom.
4. Distribute the tally page.
5. Students will tally each category.
6. Teacher models how to create the bar graph on paper.
   *Refer to the chart made in language arts class about the essential components of a bar graph. If any are missing, now is the time to add to it (e.g., title, categories, numbers, key).*
7. Students will independently create the bar graph on paper.
8. Show students how to create a key.
9. Teacher will continually check work.
10. Teacher should model adding a title to the chart.
11. Teacher should model how to create a key.
12. Indicate the x and y axis.
13. Work with each group to determine what they should number their graph by. These numbers are easy most first through third graders to count by.

**Session 3:**

1. Group the students.
   *You will need as many groups as there are classes you are surveying. For example, if there are four second-grade classes you will need four groups.*
2. Send them to an assigned classroom.
   Confer with other teachers ahead of time, so they know which students will be coming to conduct the surveys.
3. When the groups return to the classroom, each group is given a “Fast Food Survey” tally sheet.
4. The students can work in teams to total the data.
5. Teacher should also be rotating around the room.
6. After each group has tallied the totals, share (briefly) as a whole group the data that was collected.
Session 4:

1. Working in the computer lab, the teacher explains to the students that the computer will be used to tally the data electronically as well as create a similar graph.

2. Teacher should use the computer and projector to model how to create a spreadsheet to complete the same assignment.
   *The template is created ahead of time.*

3. Students can open the same template on their computer.

4. Students should enter the data from their tally sheet into the spreadsheet.

5. The total formula will automatically calculate the answer.

6. The teacher should model how to create bar graph using MS Excel®:
   a. Select the labels and the data.
   b. Since those cells are not next to each other (adjacent), hold the CTRL key to select all of them.
   c. Press the F11 key to generate the graph.
   d. The key will not be representative of the graph, click on it and press delete.
   e. Add a title by clicking on the title which appears, press the = key and then go to the spreadsheet with the data and click the appropriate subtitle.
   f. A chart will be put on a separate sheet. To go back to the data, look at the sheet tabs in the lower left hand corner. It will be called sheet1.
   g. Wow, that looks great!

7. Students should make a graph for each of the questions.

8. After all of the individual graphs are completed, students will work in small groups to make a graph that represents entire second grade data.

9. Once the group has completed their graph, instruct students to write three to four facts or observations about their graph’s data. (For example, at Parker Elementary, most second graders chose McDonald’s as their favorite fast food restaurant, etc.)

10. Remind students to pay attention to penmanship.

11. Print and post graphs and writings in the hallway.

**Differentiated Instruction Strategies:** ([http://www.teach-nology.com/tutorials/teaching/differentiate/bottom_line/](http://www.teach-nology.com/tutorials/teaching/differentiate/bottom_line/))

**Intervention:** The teacher is constantly observing students during this lesson, therefore always providing individualized instruction if needed. Students are also grouped so that students who may have difficulty can easily learn from others in the group. Encourage group discussions.

**Enrichment:** Challenge groups to design their own survey questions and collect data and organize it into a graph. (Maybe use a different type of graph.) Students can share results with entire 2nd grade classes.
Extension:
• Students can create a graph on the Web using NCTM Illuminations Web site (http://nces.ed.gov/nceskids/Graphing).
• Have students make different types of graphs with the same data and compare graphs.

Homework Options and Home Connections:
• Have students ask parents or guardians same questions at home to see what their answers are compared to their own. (How many do we have the same? How many are different?) Share with a friend the next morning!
• Find a graph in a newspaper or magazine. Discuss the meaning of the graph.

Key Vocabulary:
• Bar graph: A chart with bars whose lengths are proportional to quantities.
• Data: A collection of facts from which conclusions may be drawn.
• Survey: A detailed critical inspection.
Source: http://www.thefreedictionary.com/bar%20chart

General Tips:
You will want to plan about a week for this lesson. Students should have been exposed to and worked with bar graphs before this lesson takes place. They should know most of the key vocabulary.

Resources:

Lesson Development/Background:
In mathematics today, it is important for students to know the process of data analysis, such as surveying, gathering data, organizing it, and then communicating that data in some way to an audience. This lesson is geared toward second graders but can be modified for first and third graders.
By looking at the graphs, how many children chose breakfast as their favorite meal to eat at a fast food stop?

☐ 50

☐ 19

☐ 25

Suppose 5 more children chose Burger King® as their favorite fast food restaurant: How would the graph have been different?

How many more children voted yes that they would play on the jungle gym than no?

Is that more or less than 30?

How many more or less?
Fast Food Survey

We are surveying the second grade classes to see what their favorite fast food restaurant is, among other things! Please read the questions and put a check mark beside your choice. Thank you for helping with our activity.

1. What is your favorite fast food restaurant?
   - [ ] Arby’s
   - [ ] McDonald’s
   - [ ] Burger King
   - [ ] Wendy’s
   - [ ] Other

2. What is your favorite beverage?
   - [ ] Coca-cola
   - [ ] Pepsi
   - [ ] Milk Shake
   - [ ] Milk
   - [ ] Other

3. What is your favorite meal to have at a fast food restaurant?
   - [ ] Snack
   - [ ] Breakfast
   - [ ] Lunch
   - [ ] Dinner