**Routines and Data**

Establishing routines in the first few weeks of school is crucial for a successful school year. This is especially true when teaching elementary school, specifically first grade. This unit focuses on teaching routines within the first five weeks of school. It shows students that mathematical tasks and activities are meaningful and interesting. This unit teaches students that while learning routines they can also learn other valuable information such as posing questions, collecting data related to the questions, and analyzing the data. This allows the students to have a real world connection to counting. This unit is essential in developing students number sense and other number concepts. This unit allows students the opportunity to work with manipulatives. The unit also introduces students to the concept of place value, skipping counting by 2’s, 5’s, and 10’s, and money.

In this unit, students will:

* establish daily math routines to be carried out throughout the year, such as lunch count, daily questions, calendar activities, working with a 0-99 chart, etc
* count and represent the number of a quantity (0-100) using numerals
* represent numbers (0-100) in terms of tens and ones using counters and pictures
* locate 0-100 on a number line (line can be curved like in a game)
* compare using the terms greater than, less than, and equal to
* use the strategies of counting on and counting back to understand number relationships;Add bullets to reflect the additional daily rountines
* pose information questions
* collect data
* organize and record results using tallies, tables, picture graphs, and bar graphs and
* group objects according to common properties, such as color, size, length, etc

(Georgia Performance Standards Frameworks, 2009)

Standards for this unit:

**M1N1. Students will estimate, model, compare, order, and represent whole numbers up to 100.**

1. Represent numbers up to 100 using a variety of models, diagrams, and number sentences. Represent numbers larger than 10 in terms of tens and ones using manipulatives and pictures.
2. Correctly count and represent the number of objects in a set using numerals.

c. Compare small sets using the terms greater than, less than, and equal to.

d. Understand the magnitude and order of numbers up to 100 by making ordered sequences and representing them on a number line.

**M1D1. Students will create simple tables and graphs and interpret them.**

1. Interpret tally marks, picture graphs, and bar graphs.
2. Pose questions, collect, sort, organize and record data using objects, pictures, tally marks, picture graphs, and bar graphs.

**M1P1. Students will solve problems (using appropriate technology).**

1. Build new mathematical knowledge through problem solving.
2. Solve problems that arise in mathematics and in other contexts.
3. Apply and adapt a variety of appropriate strategies to solve problems.
4. Monitor and reflect on the process of mathematical problem solving.

**M1P2**. **Students will reason and evaluate mathematical arguments.**

1. Recognize reasoning and proof as fundamental aspects of mathematics.
2. Make and investigate mathematical conjectures.
3. Develop and evaluate mathematical arguments and proofs.
4. Select and use various types of reasoning and methods of proof.

**M1P3**. **Students will communicate mathematically.**

1. Organize and consolidate their mathematical thinking through communication.
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

**M1P4. Students will make connections among mathematical ideas and to other disciplines.**

1. Recognize and use connections among mathematical ideas.
2. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
3. Recognize and apply mathematics in contexts outside of mathematics.

**M1P5. Students will represent mathematics in multiple ways.**

1. Create and use representations to organize, record, and communicate mathematical ideas.
2. Select, apply, and translate among mathematical representations to solve problems.
3. Use representations to model and interpret physical, social, and mathematical phenomena.

**Essential Questions for Routines and Data Unit:**

* What does a number represent?
* How can we represent a number?
* What is a tally mark?
* How do we use tally marks?
* How can the information from questions be used to create a graph?
* How can we represent a number using tens and ones with objects and symbols?
* What can a number line show us?
* Why would we use a number line?
* What do less than, greater than, and equal to mean?
* What information can we get from a graph?
* How do tables and graphs help us organize our thinking?

## Lesson Plan

### Introduction

###  This lesson on tallying and graphing is designed for a group of first grade students. The

###  class will consist of 20 grade students. Together as a class we will complete the

###  following tallying and graphing activity together. Students will actually complete part

###  of this activity independently while the teacher will facilitate when needed. The students

###  have been learning about tallying and graphing through the entire unit of Routines and

###  Data. This activity will allow students to complete a tally table, picture graph, and pose

###  questions related to their information. This lesson will be completed later in the unit

###  when students already have an understanding of tallying and graphing as well as how to

###  pose appropriate questions.

### Outcomes

### Students will be able to complete a tally table and picture graph independently.

* Students will be able to answer the following questions:

What information can we get from a graph?

How do tables and graphs help us?

### Standards

 **M1D1. Students will create simple tables and graphs and interpret them.**

* 1. Interpret tally marks, picture graphs, and bar graphs.
	2. Pose questions, collect, sort, organize, and record data using objects, pictures, tally marks, picture graphs, and bar graphs.

 **M1P3**. **Students will communicate mathematically.**

1. Organize and consolidate their mathematical thinking through

communication.

1. Communicate their mathematical thinking coherently and clearly to peers,

 teachers, and others.

1. Analyze and evaluate the mathematical thinking and strategies of others.
2. Use the language of mathematics to express mathematical ideas precisely.

### Resources

Students have previously learned about tally marks, tally tables, and types of graphs. Before beginning the lesson we will review together as a whole group how to make and use tally marks, such as what happens when we are using tally marks and we get to five. Should we keep making tally marks or should be we tally down to have a group of five? We will practice together making tally marks and counting the groups by 5’s. We will also review the books Tally O’Malley by Stuart J. Murphy. During this time we will use the smartboard and together complete a tally table. After doing this we will complete a bar graph together on the smartboard. We will also view a teacher created video about tallying and graphing. This will allow students time to review how to complete the two items that will be in the assignment.

**Online:**

Students will also use the following online games to reinforce the skills

they have previous learned before beginning the independent assignment.

This games has students match the words to the type of graph:

<http://www.mhschool.com/math/2003/student/activity/courses/grk/ch06a/>

This game has students allows students to view a graph and then answer questions

related to the graph:

<http://www.mhschool.com/math/2003/student/activity/courses/grk/ch06a/>

This games has students survey a group and put the tally marks in the correct

column. It also has the students total each row by counting the tally marks.

<http://www.mhschool.com/math/2003/student/activity/courses/grk/ch06a/>

**Integration of Technology**

###  In this lesson students will use the smartboard as their key component of technology.

###  The smartboard will be used whole group with students and will allow each student to be

###  a part of the experience. The smartboard will be used in this lesson for practice making

###  tally marks as well as counting them and making graphs. The smartboard will also allow

###  students to play games related to the concepts we are learning.

### Materials

###  Smartboard Chart paper

###  Graph Paper Pictures for graph

###  Pencils Crayons

###  Writing paper Scissors

###  Glue

### Process

###  Preparation:

###  To prepare for this assignment the smart files will already be made for the smartboard.

###  The games that will be used will also be saved in a favorites folder on the computer so it

###  will be easily accessible when ready to use. The graph paper for the activity will already

###  be made and copied (20) along with the pictures of the different sports balls for the graph.

###  Lesson:

 This lesson will be completed from start to finish as a whole group assignment with some

 independent practice when completing the actual graph. Students will work together as a

whole group to complete portions of this lesson such as the tally table. They will

however complete the graphing portion of this lesson independently.

After, reviewing tallying, graphing, and taking a few minutes to play the tallying and

graphing games the introduction to the assignment will begin. To introduce the lesson

the students will be asked what type of things could we graph. The teacher will

facilitate this activity into having students proceed answers such as what are favorite

foods are, if we walk, ride in a car, or a bus home from school, what are favorite sports

are, etc. Once the students identify that we can graph what our favorites sports are the

students will be given the opportunity to discuss different types of sports, sports they

have participated in, or sports their siblings have participated in. When the class has

finished this discussion we will discuss how we could keep track of everyone’s favorite

sport. We will discuss how a tally table would be very helpful to use. The pre-made

tally table will be displayed on the Smartboard. Then each student will have the

opportunity to put a tally mark in the spot of their favorite sport. After, each student has

had the opportunity to place their tally mark in the tally table as a whole group we will

discuss questions related to the tally table.

Such as:

 How did we choose to represent our classmates votes?

 Which sport did the least amount of students choose?

 Which sport did the most amount of students choose?

 What other questions can we pose that could be answered by this tally table?

Now that the tally table is complete and the class has had the opportunity to answer and

pose question that we could answer from the information represented. We will begin

discussing how we can use the information in the tally table to create a graph. We will

discuss the three different types of graphs that we can use picture graph, bar graph, and

real life graph. The student will then be told that we are going to use the information

from the tally table to create a picture graph. The students will be shown the graph that

that they are going to use as well as the pictures they will use. We will once again review

that they should use the information in the tally table to create the picture graph by asking

questions to the class such as;

 How many basketballs would we glue on to your graph?

 How do you know how many footballs to glue on to your graph?

 How would you find out how many more people chose tennis than baseball?

After, reviewing this information and passing out the graph and the graph pictures

students will be sent to their seats to complete this activity independently. While

students are completing this activity independently the teacher will circulate throughout

the classroom providing assistance when necessary.

When all of the students have completed their graph the students will have the a

opportunity to think, pair, and share. During this time students will discuss their graphs

and how they are similar or different.

### Assessment

 The assessment for this activity will be the independent portion of the assignment. This

 is where the students transfer the information from the tally table to the actual picture

 graph.

### Extensions/Modifications

 To accelerate my above grade level students they will be asked to create a bar graph to represent the information in the picture graph. The above grade level students will also be asked to pose questions related to their graphs and write the correct answers.

To assist my special education students I will the special education teacher, special education paraprofessional, or I will read any directions related to the assignments as well as any other information that will need to be read. If the students are having a difficult time transferring the data from the tally table on the smartboard to their own picture graph then they will be able to come to the smarboard count the number of people who chose baseball then go back to their seats and cut out that many baseballs to glue to their picture graph. These students will also be allowed extra to complete the assignment if needed.

**Culminating Activity**

The culminating activity for this unit, Routines and Data, will demonstrate the level of understanding of from this unit. This activity will be complex and will demonstrate the students evidence of learning. This activity will allow students to receive a level 3 or level 4 in the area of Data and Probability on their Standards Based report card.

For students to be able to complete this activity they must already have the prior experience reading and creating tally tables, picture graphs, bar graphs. Students will also need to be able to transfer data from graph to another (ie: tally table to bar graph).

Students will choose their own topic for this activity (favorite color, tv show, food, special). Students will create a tally table and then survey other students in the class. After surveying the other students they will just their tally table and decide which type of graph would be best to represent the data they have collected. When the graphs are completed students will need to use the information from the graph to create at least three questions about the graph. They will also need to answer the questions correctly based on the information from their graph.

References:

Georgia Performance Standards (2009) Frameworks: <https://www.georgiastandards.org/Pages/Teachers.aspx>