

## **TE 801 Unit Plan: Fourth Grade – Collecting and Organizing Data**

### **SECTION ONE – BIG IDEAS, LEARNING GOALS, AND RELATED SKILLS**

#### **Big Ideas:**

- We can all collect data! This is often accomplished by: conducting experiments, counting, and/or measuring.
- Once data has been collected and sorted, it can be used to make a graph. \*\*It is important to remember that the collected data can be represented in a variety of ways.
- Graphs are a way of organizing data and they appear in newspapers, magazines, on the Internet, in the news, and in other “every day” places.
- In order for graphs to have meaning, they must be interpreted.
- Graphs can be used as a means to compare collected, sorted, and classified data.
- There are specific ways to interpret data on a graph and to summarize what it represents. For example: Mean, Median, Mode, and Range.

#### **Related Skills and Goals:**

##### *GLCEs*

##### *Students will...*

- **D.RE.04.0:** Construct tables and bar graphs from given data.
- **D.RE.04.02:** Order a given set of data, find the median, and specify the range of values.
- **D.RE.04.03:** Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.

Students will be able to communicate mathematical thinking coherently and clearly to peers, and teachers.

Students will be able to collect data using surveys and represent that data using tables and graphs; such as lines plots, bar graphs, and stem-and-leaf plots.

Given a chart or graph, students will be able to find range, mode, median, and average for the data.

##### *NCTM Standards*

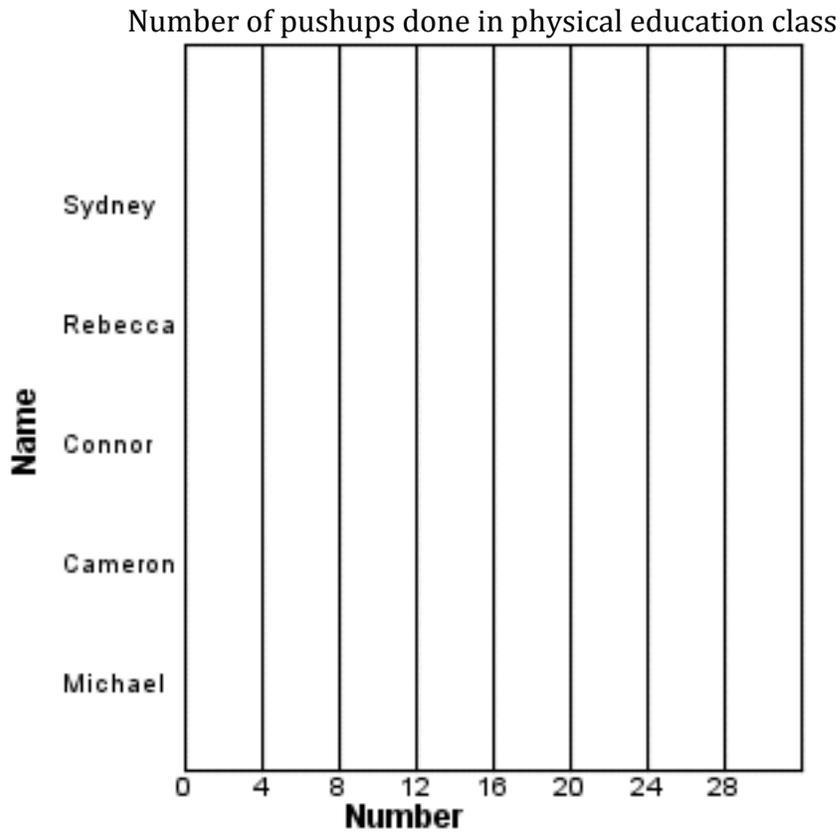
##### *Students will...*

- Formulate a survey question and collect data for this question.
- Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed.
- Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.
- Propose and justify conclusions and predictions that are based on data.

## SECTION TWO - ASSESSMENTS

### **PART A: Assessment Plan**

#### **Copy of Pre-Assessment:**

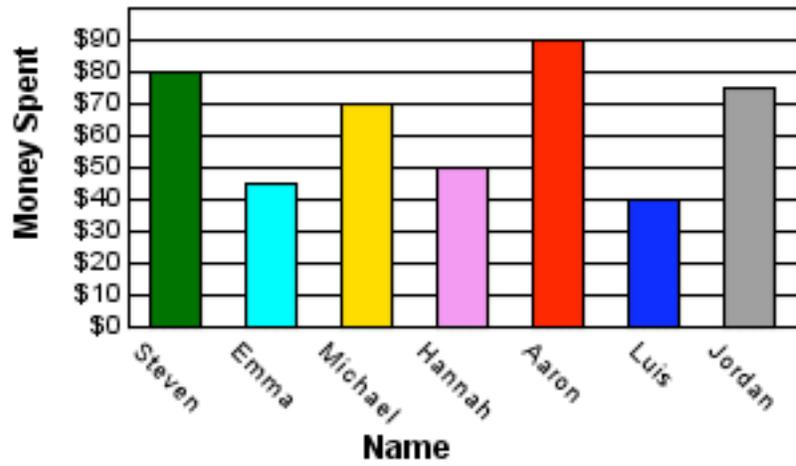


Number of pushups done in physical education class

<b>Name</b>	<b>Number</b>
Cameron	29
Rebecca	5
Michael	21
Connor	20
Sydney	22

- How many more pushups did Cameron do than Michael?
- How many pushups did Connor do?
- Who did the fewest pushups?

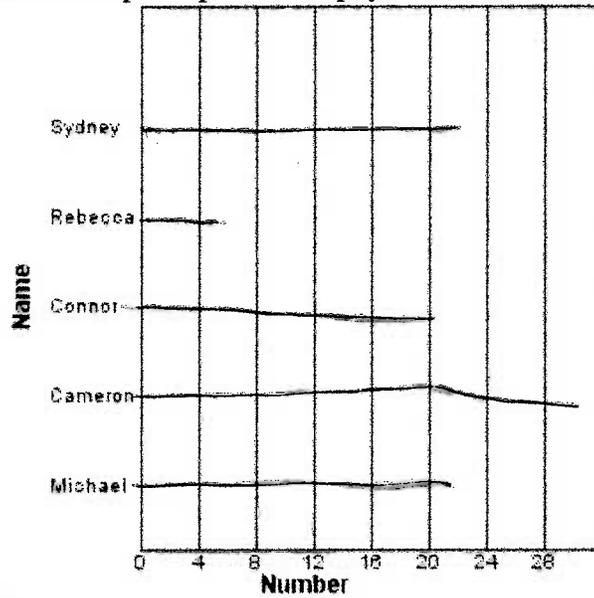
## Money Spent on Sneakers



- What is the median of the data?
- How much did Michael and Emma spend altogether on their sneakers?
- What is the average amount spent on all 7 sneakers? Round your answer to the nearest cent.

Ricardo Alvarez

Number of pushups done in physical education class



Number of pushups done in physical education class

Name	Number
Cameron	29
Rebecca	5
Michael	21
Connor	20
Sydney	22

a. How many more pushups did Cameron do than Michael?

$$\begin{array}{r} 21 \\ - 8 \\ \hline 13 \end{array}$$

b. How many pushups did Connor do?

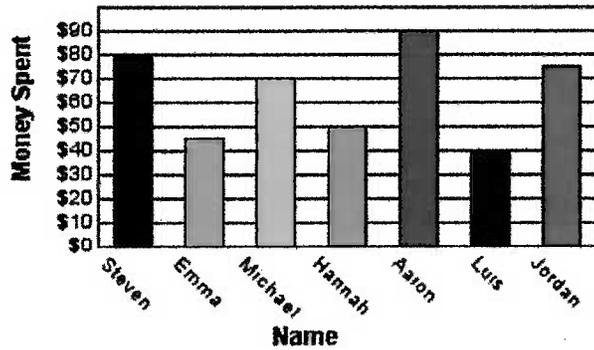
20

c. Who did the fewest pushups?

Rebecca

# Ricardo Alvarez

Money Spent on Sneakers



a. What is the median of the data?

Spending money

$$\begin{array}{r} 42 \\ + 70 \\ \hline \end{array}$$

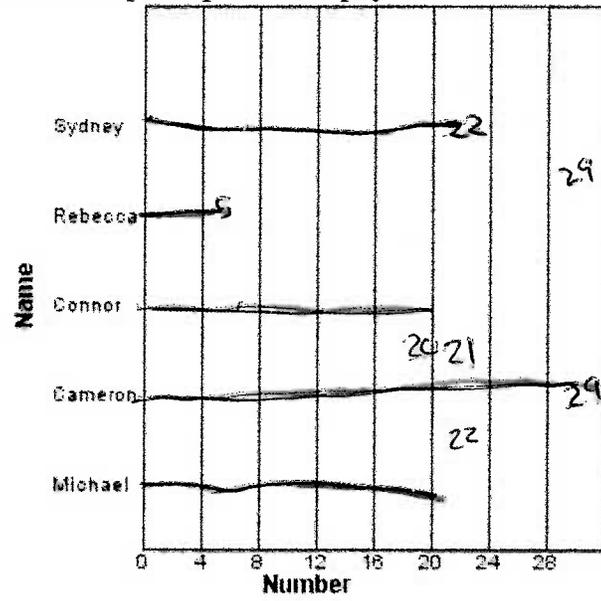
b. How much did Michael and Emma spend altogether on their sneakers?

$$\begin{array}{r} 42 \\ + 70 \\ \hline 112 \end{array}$$

c. What is the average amount spent on all 7 sneakers? Round your answer to the nearest cent.

$$\begin{array}{r} 80 \\ + 42 \\ 70 \\ 50 \\ 90 \\ 40 \\ + 74 \\ \hline 486 \end{array}$$

Number of pushups done in physical education class



Number of pushups done in physical education class

Name	Number
Cameron	29
Rebecca	5
Michael	21
Connor	20
Sydney	22

a. How many more pushups did Cameron do than Michael?

8

b. How many pushups did Connor do?

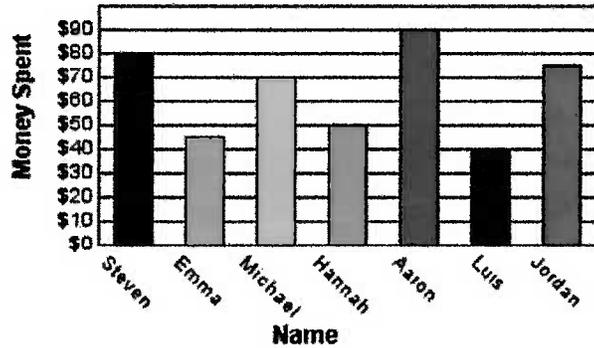
20

c. Who did the fewest pushups?

Rebecca

WD

### Money Spent on Sneakers



80  
45  
70  
50  
71  
+40  

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402

a. What is the median of the data?

50\$

b. How much did Michael and Emma spend altogether on their sneakers?

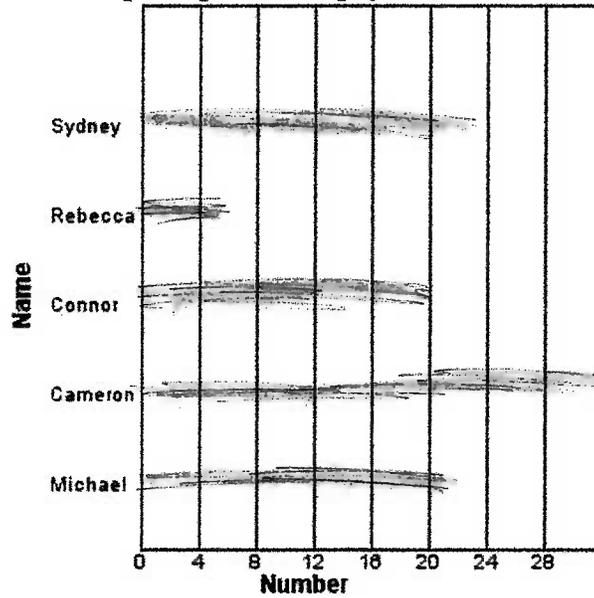
110\$

c. What is the average amount spent on all 7 sneakers? Round your answer to the nearest cent.

402\$

Tiana S 9-29-10

Number of pushups done in physical education class



Number of pushups done in physical education class

Name	Number
Cameron	29
Rebecca	5
Michael	21
Connor	20
Sydney	22

a. How many more pushups did Cameron do than Michael?

$$\begin{array}{r} 29 \\ -22 \\ \hline 08 \end{array}$$

b. How many pushups did Connor do?

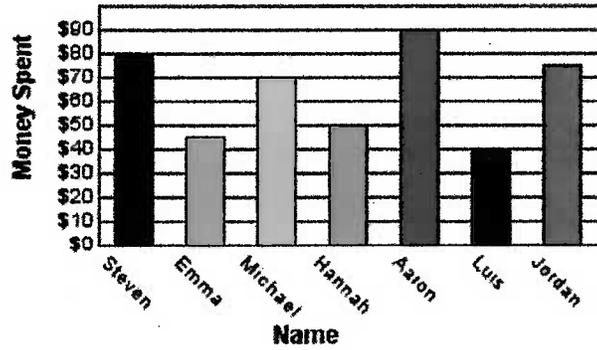
20

c. Who did the fewest pushups?

Rebecca

Tiana S 9-29-10

Money Spent on Sneakers



a. What is the median of the data?

\$50-\$100

b. How much did Michael and Emma spend altogether on their sneakers?

$$\begin{array}{r} 170 \\ + 45 \\ \hline 115 \end{array}$$

c. What is the average amount spent on all 7 sneakers? Round your answer to the nearest cent.

$$\begin{array}{r} 440 \\ 80 \\ 90 \\ 75 \\ 45 \\ 70 \\ + 50 \\ \hline 440 \end{array} \quad \begin{array}{r} 2 \\ 4 \\ 16 \\ 19 \\ + 9 \\ \hline 44 \end{array}$$

### **Pre-Assessment Reflection:** *Students: WD, Tiana, and Ricardo*

After conducting my interview with Ricardo, WD, and Tiana, I was able to gather valuable information that will inevitably be an essential aspect of the planning and implementation of my unit plan. After reviewing the way in which the students answered the questions, I feel comfortable in making the assertion that these students have encountered bar graphs on previous occasions...either in math, social studies, or in other subjects, while in previous grades.

Ricardo, WD, and Tiana were able to easily read and comprehend the table of data and transfer that data into a bar graph form. I was surprised at how quickly the students completed the first page. I did not anticipate all three of them to correctly fill in the bar graph using the table of data. I expected them to write the number given in the table, next to the name on the y-axis of the graph. WD started to do this, and then erased his initial markings and re-did the graph to look like a typical bar graph. Both Tiana and Ricardo completed the graph to make it look like their ideas of typical bar graphs.

I also expected the students to struggle for a longer amount of time on page two. All three of them wrote an answer, quickly, for the first question regarding median. Their answers have provided me with a look at their misconceptions. Ricardo believed the median referred to the y-axis of the graph (i.e., spending money), WD wrote \$0-100, and Tiana wrote: \$50. I believe she was referring to the fact that \$50 is the middle number between 0 and 100. Her answer is the closest to the actual definition of median. However it is obvious the students are unsure of how median is defined. This will be covered in my unit, and I will pay special attention to the comparison between median, range, and mode. WD, Ricardo, and Tiana also struggled with the third question, regarding average. Each of them decided to find the total amount of money spent. Once again, this helps me see where their thinking is in regards to the definition of average and I feel that I can better explain this term in my unit.

As a result of this interview, I feel that I have developed a higher level of awareness as to where the class may fall in regards to their understanding of data, collecting data, and creating bar graphs.

### **Summative Assessment and Analysis:**

Each student will choose a survey question, survey 4<sup>th</sup> graders during a special free-for-all survey time, organize their data, create a table, create a bar graph and then use the computer to create another type of graph to present. They will find the mean, median, mode, and range for their data, then give a short presentation about their findings to the class. Classmates will be able to ask questions and make comments about the data and graphs. The table, graphs, mean, median, mode, and range will be displayed on a piece of colored poster board, to be used as a visual aid during their presentation.

This assessment matches the goals of formulating a survey question, collecting data, organizing data, and representing data graphically. Students will be representing social phenomena with a model and communicating mathematical ideas to their classmates and teacher. Students are constructing bar graphs and tables.

Children need to know about what kind of question will work best for the survey. We will have a discussion in class about how to word a survey question and how it can be helpful to offer answer choices for the question. They will need to know how to organize data into a table and a bar graph. They will need to know how to find range, median, mean, and mode for a set of data.

I expect some initial difficulty with students deciding on a survey question. Hopefully the discussion about picking a question will help with this. Finding the mean and median may be difficult for some, along with remembering the difference between the two.

Some students may have difficulty sharing their ideas in front of the class. However, one of the unit goals is being able to effectively communicate mathematical ideas. That being said, it is my hope that after looking at numerous graphs and spending time discussing the process of collecting data in whole group and small group discussions, students will be comfortable with this kind of talk.

This assessment emphasizes visual representations of ideas, as well as verbal representations of ideas. There is a kinesthetic aspect in that students will get to move around the classroom as they conduct their survey. That part of the assessment is also social, as students are interacting with one another to complete the task. The assessment appeals to the logical learning style because it deals with organization. For those students who excel when utilizing a more creative outlet, I will emphasize the poster aspect; using color and giving their poster/graph a title. Creativity can also be used in thinking up a unique survey question.

Scales of a Fish Problem:

*"You can determine the age of a fish by its scales, which have growth rings like trees. Each ring represents 1 year. The life span of a French Angelfish is about 14 years, and the life span of a Queen Parrotfish is about 5 years. The life span of a Queen Triggerfish is about 12 years, and the life span of a Coney is about 4 years. Which two fish have the greatest difference in life spans?"*

Students are given this problem. As a large class, we will discuss why making a graph would be a good strategy to use in this problem. Then, in small groups, students will create a graph to represent this data and they will use their graphs to help solve the problem. Once every group has created their graph, we will share the different graphs and participate in a discussion.

The next day, using the same graphs they created the day before, the small groups will each write questions (two) about the data and then exchange questions with other groups. The groups will discuss these questions and write their answers for the questions based on the information presented. Groups will exchange work again and analyze responses, making corrections where necessary. Once students have answered the questions we will reconvene as a large class and discuss the questions they were presented with, how they answered those questions and their feelings regarding the activity.

This assessment will meet the goal of solving problems using data in tables and graphs. The students will need to know how to read tables and charts in order to successfully complete this task. This assessment does not meet all learning goals because the others are addressed with the final project. The main focus of this assessment is problem solving with tables and graphs.

The ability to compare and contrast data is a skill needed for this assessment. I expect students to have the most difficulty in coming up with questions regarding the information in the graph to exchange with other groups. This is why I will have the students work in small groups in order for them to have a variety of minds to think together.

I anticipate some students being overwhelmed by all the steps in the problem, so I will explicitly break down the assessment into steps to lessen anxiety. I will also be creating a pictograph with the whole class that way they can reference this chart while they create their questions. Careful reading of the problem is necessary. Reading is not an explicit skill of the unit, so I will read the problem with the whole class and clear up any questions before the students work on their own. This assessment emphasizes problem solving, visual representation and computation. I will collect all work students do to answer their questions and the questions they wrote. If some students need to write out what is going on, use labels, or breakdown computations into smaller parts, that's fine. This will show me more about their learning styles and problem solving styles. This also shows me that their incorrect answer came from a computation mistake, not a misunderstanding of the problem.

**Formative Assessments:**

In order to differentiate my instruction and meet the needs of the individual

learners in my classroom, I will make sure to utilize a variety of teaching strategies in my unit. I will incorporate small and large group discussion that will provide students an opportunity to participate in a less stressful way. I will utilize "Think-Pair-Share" as a way to minimize the level of stress that many students encounter when presented with a new math lesson. I will also provide opportunities for independent work that many students can benefit from. Quiet time to work independently on a set of math problems will allow the mathematical concepts we've been discussing a chance to "sink in".

My classroom has a Promethean Board, which will be a wonderful tool to utilize as a means to provide my students with visual aids. I have two English Language Learners in my classroom and our Promethean Board is a great way to "show" the concepts we are discussing. Throughout my unit, my formative assessments will allow me to pace my lessons and teach at a rate that will promote active engagement and participation from every student. I will make sure the concepts being discussed are understood fully before moving on. I want to ensure an ample amount of time for students to ask questions and I want to have time to answer those questions. I will also have worksheets, and extra "challenge" questions available for students who are ahead of the rest.

In regards to students with IEPs, I do not have any students who receive extra help or instruction in math. I do have students who have difficulty focusing, but I'm hoping that the variety of instructional strategies I will be utilizing, and the quick pace of how these activities will flow will help those students stay on task. If I am having any difficulties in regards to those particular students, I will have worksheets or homework problems for them to work on independently as opposed to group work where they will impede the learning of their classmates. I hope the threat of being unable to participate in the "fun" activities will dissuade students from acting out.

### **SECTION THREE: DIFFERENTIATED INSTRUCTION**

In order to differentiate my instruction and meet the needs of the individual learners in my classroom, I will utilize a variety of teaching strategies in my unit. I will incorporate small and large group discussion that will provide students an opportunity to participate in a less stressful way. I will utilize “Think-Pair-Share” as a way to minimize the level of stress that many students encounter when presented with a new math lesson. I will also provide opportunities for independent work that many students can benefit from. Quiet time to work independently on a set of math problems will allow the mathematical concepts we’ve been discussing a chance to “sink in”.

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## SECTION FOUR: PROJECTED SEQUENCE OF LESSONS

### PART A: Schedule

### PART B: Extra Activities & Extension Activities

Day	GLCE Teaching Objective	Activity & Rationale	Materials	Big Idea
1	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objectives:</b>  <i>Students will be able to</i> explain the difference between tally tables and frequency tables.  <i>Students will be able to</i> create a cumulative frequency column in a frequency table.  <i>Students will be able to</i> compare “good” and “bad” survey questions.</p> <p><b>Process Goal:</b>            Compare different representations of the same data and evaluate how well each representation shows important</p>	<p>“Creating a Frequency Table”  <i>Harcourt Math Teacher Edition (TE)</i>, Unit 6: pg. 116</p> <p>I will begin by asking the students: “How much time do you spend reading every night?” I will record the results on the front board in a tally table. Then I will ask the question again, but limit the student responses to three choices: 5 minutes, 15 minutes, and 30 minutes or more.</p> <p>We will discuss the differences, advantages, and disadvantages. Then we will convert the tally table to a frequency table, and discuss vocab.: data, tally, surveys, frequency, and cumulative frequency</p> <p>As a class, we will go over “Check” questions 1-6 on pg. 115. In math journals the class will convert tally tables on pg. 114 to frequency tables and complete the cumulative frequency column, then answer questions 7-11 (12 as ex.credit) during independent work time. I will go over this assignment explicitly with the class. Whatever isn’t</p>	Paper Pencil Math Journal Textbook	Anyone can collect data through surveys, experiments, counting, and/or measuring, and we can organize this data into tables to help us understand what we collected.

	aspects of the data.	finished = homework  <b>This activity will accomplish my objective because:</b> Students will see how to create frequency chart when I model it for them, and they will have practice creating cumulative frequency columns in their assignment. Our class discussion will highlight good and bad survey questions.		
2	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>D.RE.04.02:</b> Order a given set of data, find the median, and specify the range of values.</p> <p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objective:</b> Students will be able to find the mean, median, mode, and range of a given set of data.</p> <p><b>Process Goal:</b> Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among</p>	<p>“Find Mean, Median, Mode and Range” <i>Harcourt Math Teacher Edition (TE)</i>, Unit 6: pg. 118A (and student textbook pg. 119)</p> <p>Using index cards, the students will record data and then organize the cards in different ways to find mean, median, range, and mode. This activity will occur in small groups. (Taken from pg. 118B TE) I will explain the vocab. terms: range, mode, median, and mean after the activity and I will have the students record these definitions into their math journals.</p> <p>As a class we will go over the “Check” problems together on pg. 120 and we will go over assignment: Problems 6-8 (pg. 120). They will re-create these tables on a separate sheet of paper, and they will add the cumulative frequency column, and find the mean, median, and mode.</p> <p>If they don’t complete = homework</p> <p><b>This activity will accomplish my objective</b></p>	<p>Math Journals</p> <p>Index cards</p> <p>Paper</p> <p>Pencils</p> <p>Textbook</p>	<p>There are specific ways to interpret data on a graph and to summarize what it represents: Mean, Median, Mode, and Range.</p>

	mathematical representations to solve problems	<b>because:</b> Students will have a “hands-on” activity that will highlight the terms: mean, median, mode, and range, and they will be able to work on these terms in small groups. Their assignment will also provide more practice.		
3	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>Objective:</b> Students will be able to read and organize data into line plots.</p> <p><b>Process Goals:</b> Compare different representations of the same data and evaluate how well each representation shows important aspects of the data. Organize and consolidate their mathematical thinking through communication.</p>	<p>“Read Line Plots” <i>Harcourt Math Teacher Edition:</i> Unit 6, pg. 122</p> <p>As a whole class, and using student participation, we will collect data on the front board (Pets activity, pg. 122B TE) and then convert that data into a line plot. As a class: go over “Learn” section. Discuss vocab.: Range, outlier</p> <p>Assign problems 4-9 (pg. 123) as independent work/homework. Give time in class to work on. Think-Pair-Share: “how are bar graphs, line plots, and frequency tables alike, and different?” Then discuss as a whole class as conclusion.</p> <p><b>This activity will accomplish my objective because:</b> As a class, we will be collecting and organizing data into line plots. The students will also have time to discuss the concept in pairs and whole class discussion. Further emphasizing its importance.</p>	<p>Paper Pencil Textbook Graph Paper Math Journals</p>	<p>Once data has been collected and sorted, it can be used to make a graph. Remember collected data can be represented in a variety of ways.</p>
4	<p><b>Objective:</b> Students will be able to make stem-and-leaf plots.</p>	<p>“Make Stem and Leaf Plots” <i>Harcourt Math Teacher Edition:</i> Unit 6, pg. 124 Students will work in pairs to create stem-and-leaf</p>	<p>12 index cards/</p>	<p>Once data has been collected and</p>

	<p><b>Process Goals:</b> Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers. Represent data using tables and graphs. Select, apply, and translate among mathematical representations to solve problems.</p>	<p>plots. (Activity from pg. 124B TE) Using index cards to record numbers and highlight the numbers in the tens place in different colors.</p> <p>Go over examples 1 and 3 on pg. 124 as a class on the Promethean Board.</p> <p>Before we do example 2, I will ask them to discuss in groups: How will you find the median in a stem-and-leaf plot?</p> <p>Then we will reconvene as a whole class and discuss and go over Ex.2. Go over 1-3 on pg. 125 as a class. In math Journals have students respond to: “Would a stem-and-leaf plot be a useful way to organize the following data: 12, 13, 15, 16, 17, 19, 17, 15?”</p> <p><b>This activity will accomplish my objective because:</b> Students will have the chance to observe while I model the process of creating stem-and-leaf plots, but they will also have the chance to create stem-and-leaf plots with a partner; thus; further allowing the topic to “sink in”.</p>	<p>partnership Pencil Highlighter Paper Textbook Math Journal</p>	<p>sorted, it can be used to make a graph. It is important to remember that the collected data can be represented in a variety of ways.</p>
5	<p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p>	<p>“Compare Graphs” <i>Harcourt Math Teacher Edition:</i> Unit 6, pg. 122 As a class we will discuss the difference between three number lines with different scales and intervals. Go over the vocab.: Scale, and interval. Go over page 126 as a class. Have students discuss</p>	<p>Paper Pencils Math Journals</p>	<p>Graphs can be used as a means to compare collected, sorted, and</p>

	<p><b>Objective:</b> Students will be able to compare data in graphs using a variety of scales.</p> <p><b>Process Goal:</b> Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data is distributed.</p>	<p>the differences between graphs A and B in small groups, then talk about together. Do “Check” problems 1-3 (pg. 126) together. Assign worksheet as homework.</p> <p><b>This activity will accomplish my objective because:</b> Students will have ample amount of time to question and discuss during our whole class discussion. Students will watch as I model the process of comparing graphs and their take-home work will continue that process.</p>	Textbooks	classified data.
6	<p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objective:</b> Students will be able to solve problems using the strategy: <i>make a graph</i></p> <p><b>Process Goal:</b> Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusion of predictions.</p>	<p>“Make a Graph” <i>Harcourt Math Teacher Edition:</i> Unit 6, pg. 128 (Summative Assessment 1) To begin this lesson, I will distribute a handout with the question (located on pg. 128) to each table group. The students will be instructed to solve the problem by creating a graph. I wont explicitly say what kind of graph, or how I want them to do it; it will be up to each group.</p> <p>Then as a whole class, we will discuss why creating a graph was helpful, what kind of graphs we created, and how we were able to answer the question.</p> <p><b>This activity will accomplish my objective because:</b> Students create a graph in small groups to help answer the question on the handout that they are given. The activity will promote an understanding</p>	Paper Pencils Handout	<p>Once data has been collected and sorted, it can be used to make a graph. Remember: collected data can be represented in a variety of ways.</p> <p>For graphs to have meaning, they must be interpreted.</p>

		of the fact that creating graphs will help you answer questions and further your investigations.		
7	<p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objective:</b> Students will be able to solve problems using the strategy: <i>make a graph</i></p> <p><b>Process Goal:</b> Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusion of predictions.</p>	<p>“Make a Graph” <i>Harcourt Math Teacher Edition:</i> Unit 6, pg. 128 We will continue the activity from the day before. Today, students will take out the graphs from the day before and each group will design two questions that can be answered by looking at the graph.</p> <p>Students will finish writing their questions then they will exchange their questions with the other groups and answer. Then they will return the questions to the original group and the original groups will correct the answers.</p> <p>We will reconvene as a large class and discuss the types of questions used. Each group will share at least one of their questions and we will discuss their feelings in regards to this activity. Groups will turn in their Questions that also have their peers’ answers on them.</p> <p><b>This activity will accomplish my objective because:</b> Students will design questions that they can only answer through the process of utilizing the graphs made the day before. The activity will promote an understanding of the fact that creating graphs will help you answer questions and further your investigations.</p>	<p>Paper Pencils Textbooks</p>	<p>Once data has been collected and sorted, it can be used to make a graph. Remember: collected data can be represented in a variety of ways.</p> <p>For graphs to have meaning, they must be interpreted.</p>

8	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>D.RE.04.02:</b> Order a given set of data, find the median, and specify the range of values.</p> <p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objectives:</b> Students will be able to collect data using surveys and represent that data using tables and graphs; such as lines plots, bar graphs, and stem-and-leaf plots.</p> <p><b>Process Goals:</b> Formulate a survey question and collect data for this question.</p>	<p><b>“Final Project”</b></p> <p>Every student will write a survey question to ask his or her peers.</p> <p>The students will get time to go and ask every student in class their question. They will record their data and begin to create their graphs using</p> <p><b>This activity will accomplish my objective because:</b> Students will be writing survey questions, collecting data, organizing data, creating graphs, explaining graphs, and finding mode, median, mean, and range.</p>	<p>Lined paper Pencils Colored paper (11x17)</p>	<p>We can all collect data! Once data has been collected and sorted, it can be used to make a graph. Remember: collected data can be represented in a variety of ways.</p> <p>There are specific ways to interpret and summarize data on a graph: Mean, Median, Mode, and Range.</p>
9	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>D.RE.04.02:</b> Order a given set of data, find the median, and specify the range of values.</p>	<p><b>“Final Project”</b></p> <p>Every student will record their data and begin to create their graphs. They will record their information in tables, graphs, they will label their</p>	<p>Lined paper Ruler Pencils</p>	<p>We can all collect data! Once data has been collected and</p>

	<p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objectives:</b> Students will be able to collect data using surveys and represent that data using tables and graphs; such as lines plots, bar graphs, and stem-and-leaf plots.</p> <p>Students will be able to find the mean, median, mode, and range of a given set of data.</p> <p><b>Process Goals:</b> Formulate a survey question and collect data for this question. Describe the shape and important features of a set of data Propose and justify conclusions and predictions that are based on data.</p>	<p>graphs, and they will find the mode, median, mean, and range of their information.</p> <p>Students will finalize their final copies of the posters.</p> <p>Students will practice for their presentations.</p> <p><b>This activity will accomplish my objective because:</b> Students will be writing survey questions, collecting data, organizing data, creating graphs, explaining graphs, and finding mode, median, mean, and range.</p>	<p>Colored Pencils Markers Crayons Colored paper (11x17)</p>	<p>sorted, it can be used to make a graph. Remember: collected data can be represented in a variety of ways.</p> <p>There are specific ways to interpret and summarize data on a graph: Mean, Median, Mode, and Range.</p>
10	<p><b>D.RE.04.0:</b> Construct tables and bar graphs from a given set of data.</p> <p><b>D.RE.04.02:</b> Order a given set of data, find the median, and specify the range of values.</p> <p><b>D.RE.04.03:</b> Solve problems using data presented in tables and bar graphs, e.g.,</p>	<p><b>“Final Project”</b></p> <p>Students will present their posters.</p> <p>Students will turn in their final assignment after presenting to the class and I will hang their work up in the hallway.</p>	<p>Posters</p>	<p>We can all collect data! Once it’s collected and sorted, it can be used to make a</p>

	<p>compare data represented in two bar graphs and read bar graphs showing two data sets.</p> <p><b>Objectives:</b> Students will be able to communicate mathematical thinking coherently and clearly to peers, and teachers.</p> <p><b>Process Goals:</b> Formulate a survey question and collect data for this question. Describe the shape and important features of a set of data Propose and justify conclusions and predictions that are based on data.</p>	<p><b>This activity will accomplish my objective because:</b> Students will be writing survey questions, collecting data, organizing data, creating graphs, explaining graphs, and finding mode, median, mean, and range. Students will also display their abilities to communicate their mathematical ideas to their peers and teacher.</p>		<p>graph. Remember: collected data can be represented many ways.</p> <p>There are ways to interpret and summarize data on a graph using: Mean, Median, Mode, and Range.</p>
EXTRA	<p>Anyone can collect data, and this is sometimes done with the help of surveys. Data collection can be used to help people make decisions.</p>	<p>You have just inherited a lot of money and want to start your own amusement park. You want to attract as many people as possible to your park, so you need to create a survey to find out what people like. Design a survey of at least 8 questions to find out how you should design your park.</p>	<p>Assignment sheet  Lined paper</p>	<p>Formulate survey questions.</p>
EXTRA	<p>To analyze data, one should know about line plots, median, mode, range, outlier and mean.</p>	<p>Of course you now know a lot about collecting, graphing and analyzing data, but 3rd graders do not. Create a book, cards or a poster that shows and explains line plots, mode, median, range, outlier, average and anything else you think is important that 4th graders next year would find helpful when learning about these things.</p>	<p>Unlined paper Markers Graph paper Colored pencils</p>	<p>Share mathematical thinking clearly to peers, teachers, and others</p>

EXTRA	There are many ways to organize and graph data. Sometimes it is helpful to represent data in more than one way.	Is there a type of graphing that we haven't done in class that you'd like to try? Line graph, pictograph, or graphs with more than one data set on them? You can either use data we've already worked with or create your own data set and try a new form of graphing.	Past data sets Graph paper Unlined paper	Graph data from a given data set.
EXTRA	To analyze data, one should know about line plots, median, mode, range, outlier and mean.	Students can get on the computers in the back room and play math Games that everyone will have a chance to play on Review Day	Computers	Analyze Data and create graphs
EXTRA		Students can be given worksheets from "Harcourt Math Workbook" to complete for extra practice.	Pencils Worksheets Paper	

## ***Discussion Lesson Plan***

***Date:*** (Tentatively) November 8<sup>th</sup>, 2010 (Monday)

***Overall lesson topic/title and purpose:***

My lesson topic/title is: “Make a Graph!” and the purpose of this lesson is to create an opportunity for students to utilize the strategy make a graph in order to solve a problem. (Total Lesson Time: 60 minutes)

***Rationale:***

This lesson is worthwhile because it directly relates to the State of Michigan’s Grade Level Expectations (GLCEs). By the end of this lesson, students will:

- **D.RE.04.0:** Construct tables and bar graphs from a given set of data.
- **D.RE.04.03:** Solve problems using data presented in tables and bar graphs

This lesson will give students the opportunity to participate in a high-level task that enables them to “do mathematics”. The process of creating a graph from a given set of data and then solving a problem using that graph requires critical thinking, meta-cognitive abilities, and problem solving strategies; skills that are essential in the “real world”, and in later grades.

***Goals/Objectives for today’s lesson:***

1. Students will be able to create a graph (such as lines plots, bar graphs, pictographs, or stem-and-leaf plots) using a given data set and they will be able to solve a problem by referencing the graph they created.

***Materials & supplies needed:***

- Paper
- Pencils
- Handout

***Procedures and approximate time allocated for each event***

• **Introduction to the lesson**

“Today we will be using the skills we’ve been discussing over the past week or so. We’ve spent time collecting data and creating frequency tables, pictographs, line-plots, and bar graphs. So now, I want to see you using a given set of information, create your OWN graphs to help you solve a problem. You will be working in your table groups. But that doesn’t mean that one person in your group will do all the work while the rest of you sit there. I want EVERYONE to participate, to offer ideas, suggestions, and input. Once every group has completed their graph, we will discuss our graphs as a group. So, as you and your group works on this activity, make sure you are thinking about WHY you are doing what you are doing. Why are you creating a bar graph instead of a line-plot,

***Academic, Social and Linguistic Support during each event:***

Throughout my introduction, I will be utilizing the Promethean Board as a visual aid for my students. I will record important notes that will help the students throughout the lesson and I will not remove these notes until after our math lesson is done for the day.

I will also be available as an academic resource for my students. I will be able to

or why are you making a graph at all? Does anyone have any questions? Okay, now I'm going to distribute the handout with the problem on it. We will go over it as a class and then you can work as a small group."

*(About 10 minutes)*

• **OUTLINE of key events during the lesson**

After introducing the lesson and giving the students an overview of my expectations, I will distribute the handout and go over that (explicitly) with the students.

Problem on Handout:

*"You can determine the age of a fish by its scales, which have growth rings like trees. Each ring represents 1 year. The life span of a French Angelfish is about 14 years, and the life span of a Queen Parrotfish is about 5 years. The life span of a Queen Triggerfish is about 12 years, and the life span of a Coney is about 4 years. Which two fish have the greatest difference in life spans?"*

*Directions: Create a graph of some kind to answer the question: Which two fish have the greatest difference in life spans? Once you have created your graph, write your answer to the question and explain how you figured out the answer.*

I will go over this with the students and make sure to answer any questions. Then I will give the groups time to accomplish their task. *(About 20-25 minutes)*

As students are working, I will circle the room and offer suggestions, feedback, or answer questions if necessary. I will also make observations as to how students are behaving...how they are participating in the activity, and whether or not certain students are being "left out". If this is happening, I will address it, and ask the group how they can fix it.

Once about 20 minutes is up, I will let the students know they have a few more minutes to work and then we're going to share. If certain groups are done already, I'll have them start working on tomorrow's step, which is: Create two questions that an individual can answer by using your graph. (I doubt any group will get to this point).

After 25 minutes is up, I will get the class's attention and quiet by: "5-4-3-2-1-0". At zero everyone will have his or her

answer questions and provide feedback for students whenever necessary.

By offering explicit instruction on my objectives, the students will have no confusion as to what is expected of them.

I will circle the room offering suggestions when needed and providing feedback for students if necessary.

I will be distributing a handout to the students with explicit instructions on what needs to be accomplished. This handout will be a good visual and hands on tool for students to reference if they are confused about the project's expectations.

The students will be sitting in groups, which may promote a less stressful environment. They will be able to talk to one another easily if they are confused and they can help one another.

If at any point I see students struggling with a specific aspect of this project, I will pause and direct students attention to the board where I will model the process of certain aspects. These visuals will remain on the board for students to reference.

Throughout the entire lesson, I will make sure students feel comfortable asking questions

attention on me, and sitting quietly.

“Alright, now, it looks like every group has had a chance to create a graph to answer the question on the handout. Who would like to share the graph their group has made?”

(If no one volunteers, I will call on specific groups to share. While I circled the room earlier, I will have made sure to take note of groups that were creating bar graphs, or another variety of graphs and I will have the groups that did different graphs share first. This will give the class more to discuss and more to observe.)

Open-ended questions I will ask to facilitate discussion:

- What kind of strategies can you use to solve the problem?  
Possible answer: make a bar graph, pictograph, line-plot, etc.
- Why is make a graph a good strategy for solving this problem?  
Possible answer: we can “see” the answer, visual, etc.
- How did you decide what kind of graph to create?

(For groups that created pictographs I will ask...)

- How did you decide what kind of picture to use in your graph?

(Question for everyone...)

- What are some questions we could ask that we could find the answer by looking at the graph?

I will make sure every group has the opportunity to participate and share their graphs and answer.

This should take about 10 minutes. I want to take time to go over this handout with the students to ensure that they don't have any questions remaining of what they need to do.

*(About 45 minutes)*

• **Closing summary for the lesson**

For the final five-ten minutes, I will have students ask questions if they have any and I will thank them for being good listeners and participators (If they were, if they weren't then I will point out what I was disappointed in and discuss ways they could have behaved better).

“Tomorrow we will pick up where we left off. I'm going to need you to work hard, and stay focused on this project during our math time that way we can get this whole project done

and asking for help if necessary. I may either answer those questions on my own, OR I may direct them to a peer who may be able to offer them their thoughts. So, I will be an academic support, but so may my students.

<p>without having to assign it as homework. Tomorrow you will use the graphs you created today so make sure you put them in a safe place. Good job today”</p> <p><i>(About 5 minutes)</i></p> <ul style="list-style-type: none"> <li>• <b><i>Transition to next learning activity</i></b> When our time is up, I will have the students put their things away and the quietest row can get in line for Music.</li> </ul>	
<p><b><i>Assessment</i></b> I will be using my formative and summative assessment strategies to assess student learning. I will observe and listen to the ways in which students create their graphs. I will also observe how students collect and record their data. I will also listen for behavior issues. I want students to be respectful of their peers, which means everyone is being included and able to ask questions and offer input. I will also be looking for everyone to participate during the class discussion and be able to articulate their mathematical thinking. Depending on what I see, I may need to alter my lesson as I go. I may have to move certain aspects of my lesson to the next day if I have to take this kind of time. But my lesson is adaptable and I have no problem doing that. Another way I will be assessing is through close listening as students ask questions. If a majority of the class has the same question, then I will take time to review that concept. Students will turn their graphs in the next day once we have used them for the following activity and I will use those graphs as a summative assessment. I will grade based on the graphs they create and on their answers to the question.</p>	<p><b><i>Academic, Social, and Linguistic Support during assessment</i></b></p> <p>During the assessment, I will utilize notebook paper to take notes, and I will record my observations of what students understand, or misunderstand. These notes will be referenced later in order to better accommodate my teaching and enable me to adapt my lesson where necessary.</p>

## ***High-Level Task Lesson Plan: DAY 1***

**Date:** (Tentatively) November 10<sup>th</sup>, 2010 (Wednesday)

***Overall lesson topic/title and purpose:***

My lesson topic/title is: “Make a Graph!” and the purpose of this lesson is to create an opportunity for students to display the skills they have acquired throughout Unit 6: Collect and Organize Data. (Total Lesson Time: 60 minutes)

***Rationale:***

This lesson is worthwhile because it directly relates to the State of Michigan’s Grade Level Expectations (GLCEs). By the end of this lesson, students will:

- **D.RE.04.0:** Construct tables and bar graphs from a given set of data.
- **D.RE.04.02:** Order a given set of data, find the median, and specify the range of values.

This lesson will give students the opportunity to participate in a high-level task that enables them to “do mathematics”. The process of creating a survey question, collecting and recording data, creating a graph, finding mean, median, mode and range, and then presenting their findings is a multi-step process that requires critical thinking, meta-cognitive abilities, and problem solving strategies; skills that are essential in the “real world”, and in later grades.

***Goals/Objectives for today’s lesson (DAY 1):***

1. Students will be able to collect data using surveys and represent that data using tables and graphs; such as lines plots, bar graphs, and stem-and-leaf plots.

***Materials & supplies needed (DAY 1):***

- Paper
- Pencils
- Large sheets of construction paper (11 x 17)

***Procedures and approximate time allocated for each event***

• **Introduction to the lesson**

“Over these past couple weeks, we’ve been discussing graphs. We’ve collected data, made frequency charts, and discussed how to find mean, median, mode and range. Today, you will all have the opportunity to display what you have learned. Today, you will be creating your own question to survey your classmates. You will collect that data, organize it (into a table), and create a graph using the information you collected. Now this is important...I want you all to realize that what you will be doing today is your final project for this unit. I want you all to focus, and work hard to show me everything you’ve learned. You will have more than just today to work on this project, so don’t rush, take your time. Once you have completed your survey and collected your data, you will be creating a poster

***Academic, Social and Linguistic Support during each event:***

Throughout my introduction, I will be utilizing the Promethean Board as a visual aid for my students. I will record important notes that will help the students throughout the lesson and I will not remove these notes until after our math lesson is done for the day.

I will also be available as an academic resource for my students. I will be able to

with your information on it to present to your classmates. I will go over EVERYTHING I expect you to have on your poster and you all will have a handout that explains it as well. I won't accept any excuses for missing information, do you understand?"

At this point, I will review with the students how to write good survey questions: offering choices as answers, offering more than 2 or 3 choices, and considering the group of people you are asking this questions. For instance: "You're not going to ask your classmates... 'What kind of car do you drive?' After discussing the process of creating a survey question, I will give them time to begin this process before I distribute the handout containing information regarding what should be included on their posters.

*(About 10 minutes)*

- **OUTLINE of key events during the lesson**

After introducing the lesson and reviewing how to write a survey question, I will give the students time to write their questions; about 10 minutes. (As they are working on their questions I will circle the room and observe/listen to how students are completing this step; providing assistance when necessary) Once I see that the majority of students have completed writing their survey question, I will allow them time to get up, and survey their classmates.

"I see that everyone is close, if not done, writing your survey questions. For the next 15 minutes, I want you all to get up and move around the room to survey your classmates (NOT YET). The only way this activity will continue, is if you behave like fourth graders; which means you are respectful of your fellow classmates and you keep your voices at an INDOOR level, if things get out of hand, I have no problem ending this activity, and giving you the unit test instead. Does everyone understand? Now, before you get up, I want to make sure that everyone collects AT LEAST 20 pieces of data...which means you need to ask AT LEAST 20 classmates you question and record this information the ways we've been practicing...Does anyone have any questions before we start?" (About a 5 minute intro. to survey time)

At this point the students will get up and begin surveying their classmates. I will circle the room, listening in as students ask their questions and observe how they collect their data. If I notice students having difficulty, I will offer assistance. This

answer questions and provide feedback for students whenever necessary.

I will model the process of deciding on a good (vs. bad) survey question, and I will explicitly describe the lesson objectives for the students.

By offering explicit instruction on my objectives, the students will have no confusion as to what is expected of them.

During the surveying process and collecting/recording data process, I will be available as an academic support. I will circle the room offering suggestions when needed and providing feedback for students if necessary.

I will be distributing a handout to the students with explicit instructions on what needs to be included in their final product. This handout will be a good visual and hands on tool for students to reference if they are confused about the project's expectations.

The students will be sitting in groups, which may promote a less stressful environment.

They will be able to talk to one another easily if they are confused and they can help one another. That being said, they will also have independent work time with quiet so they can focus and

process should take about 15 minutes.

As I observe I will pay close attention to the time. Hopefully, everyone will have time to complete his or her survey during this time. For those students that finish, I will have them sit at their desks and begin to record their data in a table. I may have to stop the survey time before everyone is complete. But hopefully everyone will get done. I will give updates: “You have 5 minutes left to finish surveying”, and so on.

When time is up, I will make sure to ask who still needs to ask any classmates a question. Those students can ask their remaining classmates. Then I will have everyone take his or her seats. I will get their attention and quiet by: “5-4-3-2-1-0”. At zero everyone will have his or her attention on me, and sitting quietly.

“Now that everyone has their data collected, I’m going to go over with you what I want you to put together for you poster.”  
(As I say this, I will distribute the handouts.)

I will read through this handout explicitly, and give students the opportunity to ask questions. I will reiterate the fact that since we have gone over these expectations as a class, and since every student has a copy of what is expected of them, I will not accept any missing information. I will also reiterate the fact that this activity is their final project and it will show me what they have learned and I want them to work really hard on it. But before I set them to work, I also want to point out the following: “Boys and Girls, Since this is going to be your FINAL product of this unit, I want your posters to look nice...if I were you, before I start to use markers and crayons, or whatever, I would record my information in pencil that way I can erase any mistakes I make. THEN I would go back and color and decorate...Does that sound like a good idea? Okay, well then I don’t want to see any of you using markers, or any other decorating utensils today”.

This should take about 10 minutes. I want to take time to go over this handout with the students to ensure that they don’t have any questions remaining of what they need to do.

*(About 40 minutes)*

• **Closing summary for the lesson**

For the next five minutes, I will have the students begin working independently on their projects. I will have a pile of construction (11x17) paper on the back table for them to pick

think on their own.

If at any point I see students struggling with a specific aspect of this project, I will pause and direct students attention to the board where I will model the process of certain aspects; such as, recording data, “good” survey questions, etc. These visuals will remain on the board for students to reference.

Throughout the entire lesson, I will make sure students feel comfortable asking questions and asking for help if necessary. I may either answer those questions on my own, OR I may direct them to a peer who may be able to offer them their thoughts. So, I will be an academic support, but so may my students.

<p>up.</p> <p>During their independent work time, I will say: “As you are QUIETLY working, I want you to listen closely to what I say...(at this point I will thank them for behaving well, or say I was disappointed in their behavior and explain why)  “Tomorrow we will pick up where we left off. I’m going to need you to work hard, and stay focused on this project during our math time that way we can get this whole project done without having to assign it as homework. I want to give you class time, so I can see how you are doing. Tomorrow you will work on your posters, I will expect to see you all creating your tables and graphs and recording those onto your poster. I will see everyone working on finding the mean, median, mode, and range for your information, and you should all think about your information and why you think it’s important, and I will see everyone recording a sentence or two about that on your poster too. We have a lot of work to do! But I’m excited to see the final products! Good job today”</p> <p><i>(About 10 minutes)</i></p> <ul style="list-style-type: none"> <li>• <b><u>Transition to next learning activity</u></b></li> </ul> <p>When our time is up, I will have the students put their things away and the quietest row can get their things out of the mailboxes and get their backpacks, etc.</p>	
<p><b>Assessment</b></p> <p>I will be using my formative assessment strategies to assess student learning on Day 1 of this activity. (This will most likely be a 3-day activity...that’s what I am planning on.) I will observe and listen to the ways in which students create their survey questions. I will also observe how students collect and record their data. I will look for survey questions that are relevant to the age group and audience, have choices, and have more than just 2 or 3 choices. When I watch students survey their classmates, I will be looking for tally marks, tables, and charts. I will also listen for behavior issues. I want students to be respectful of their peers, which means answering questions politely and keeping the noise level to a minimum so everyone can work. Once the surveying is complete, I will observe how the students transfer their collected data into frequency tables (This will be an expectation that we go over as a class on the handout).</p> <p>Depending on what I see, I may need to alter my lesson as I go.</p>	<p><b>Academic, Social, and Linguistic Support during assessment</b></p> <p>During the assessment, I will utilize notebook paper to take notes, and I will record my observations of what students understand, or misunderstand. These notes will be referenced later in order to better accommodate my teaching and enable me to adapt my lesson where necessary.</p>

If I notice students having a hard time writing their questions, I will take a “time-out” and refresh students’ memories on how to do this. If I notice students having a difficult time recording the data they are collecting, I will stop the surveying process and direct the class’s attention to the front board and model how I would collect data in a survey. I may have to move certain aspects of my lesson to the next day if I have to take this kind of time. But my lesson is adaptable and I have no problem doing that. Another way I will be assessing is through close listening as students ask questions. If a majority of the class has the same question, then I will take time to review that concept.

### ***High-Level Task Lesson Plan: DAY 2***

***Date:*** (Tentatively) November 11<sup>th</sup>, 2010 (Thursday)

***Overall lesson topic/title and purpose:***

My lesson topic/title is: “Make a Graph!” and the purpose of this lesson is to create an opportunity for students to display the skills they have acquired throughout Unit 6: Collect and Organize Data. (Total Lesson Time: 1.25 hours)

***Rationale:***

This lesson is worthwhile because it directly relates to the State of Michigan’s Grade Level Expectations (GLCEs). By the end of this lesson, students will:

- **D.RE.04.0:** Construct tables and bar graphs from a given set of data.
- **D.RE.04.02:** Order a given set of data, find the median, and specify the range of values.

This lesson will give students the opportunity to participate in a high-level task that enables them to “do mathematics”. The process of creating a survey question, collecting and recording data, creating a graph, finding mean, median, mode and range, and then presenting their findings is a multi-step process that requires critical thinking, meta-cognitive abilities, and problem solving strategies; skills that are essential in the “real world”, and in later grades.

***Goals/Objectives for today’s lesson:***

1. Students will be able to collect data using surveys and represent that data using tables and graphs; such as lines plots, bar graphs, and stem-and-leaf plots.
2. Students will be able to find the mean, median, mode, and range of a given set of data.

***Materials & supplies needed:***

- Paper
- Pencils
- Large sheets of construction paper (11 x 17)
- Coloring/decorating materials (crayons, markers, colored pencil)
- Scissors
- Glue

<b><i>Procedures and approximate time allocated for each event</i></b>	<b><i>Academic, Social and Linguistic Support during each event:</i></b>
<p>• <b><u>Introduction to the lesson</u></b>  “Alright, today, we’re going to pick up where we left off yesterday with our graphing project. You all should have collected your 20 (AT LEAST!) pieces of data. And you should have started transferring that data you collected into frequency tables. If you haven’t done that already, then that’s where I want you to start. Remember, a frequency table ALSO needs to have a Cumulative Frequency Column. (I will remind students what this is on the front Promethean board.) How many of you have finished creating your Frequency Table?” (If no one raises their hand, then I will tell them to get started...if some do, then I will say...) “Now I want everyone to listen because when you are finished with your frequency tables, this is what you’ll do...You will create a graph of the information you have collected. You can either create you graph on your poster (IN PENCIL) or you can create it on a piece of scrap paper before you transfer it to you poster. Either way, it doesn’t matter; I just want you to take your time. Now Everyone should have his or her handout from yesterday on your desk.” (They will have to get it out)</p> <p>Once they’ve gotten their handouts out, I will review what is expected of them today: recording their tables and graphs onto the poster, finding mean, median, mode, and range and recording that information onto their poster, and writing a sentence or two about their information onto their posters. Their handouts will not have the definitions of mode, median, mean, or range on them. BUT, I will remind them that they have these definitions in their math journals and in their textbooks, so if they don’t remember, then they will need to use their resources.</p> <p>Finally, I will give the students an opportunity to ask questions if anyone is confused. I will answer those questions and if it seems like the questions are all concerning a similar concept, I will review that concept on the Promethean Board.</p> <p><i>(About 15 minutes)</i></p> <p>• <b><u>OUTLINE of key events during the lesson</u></b>  After introducing the lesson and reviewing what we did yesterday and my expectations for today, I will give the students time to work independently. They will be sitting in their table groups, so if they keep their voices low they can talk and ask questions of their peers.</p>	<p>Throughout my introduction, I will be utilizing the Promethean Board as a visual aid for my students. I will record important notes that will help the students throughout the lesson and I will not remove these notes until after our math lesson is done for the day.</p> <p>I will also be available as an academic resource for my students. I will be able to answer questions and provide feedback for students whenever necessary.</p> <p>I will explicitly describe the lesson objectives for the students. By offering explicit instruction on my objectives, the students will have no confusion as to what is expected of them.</p> <p>Throughout the class’s independent work time, I will be available as an academic support. I will circle the room offering suggestions when needed and providing feedback for students if necessary.</p> <p>I will have the students reference the handout with explicit instructions on what needs to be included in their final product. This handout will be a good visual and hands on tool for students to reference if they are confused about the project’s</p>

(As they are working on their posters, I will circle the room and observe/listen to how students are completing these steps; providing assistance when necessary)

This is a multi-step process they are working through, so I may need to provide numerous encouraging words to the class to keep working through the project, step by step. I don't want them to feel overwhelmed.

I will also pay close attention to the students who are getting their poster completed quickly. I will make sure they are doing what I ask of them correctly and if they are, I may direct them to a classmate that needs help.

I will be providing the students with a large amount of time to work on their posters. In all, they will have about 50 minutes of uninterrupted work time to complete their posters. When 25 minutes have past, I will ask for their attention, and tell them how much time they have left and explain that I need them to be finishing up.

As I observe, I will pay close attention to the time. Hopefully, everyone will have time to complete his or her poster. For those students that finish, I will have them help their peers who may need assistance, and I will tell them to practice their presentation for the next day.

*(About 50 minutes)*

• **Closing summary for the lesson**

When our 50 minutes is up, I will get the students' attention and quiet by: "5-4-3-2-1-0". At zero everyone will have his or her attention on me, and sitting quietly.

"Please raise your hand if you have not completed your poster"  
(If students raise their hand, then I will instruct them to take it home and finish, if they need to borrow any classroom resources to do that, they can...if no one raises their hand then I will say...)

"You all did a great job staying on task and working hard today (or I'll say what I'm disappointed in). Tomorrow, you will be presenting your posters to your classmates and myself. I'm looking forward to seeing the hard work you put into this project! If I were you, I would take my poster home and practice what I'm going to say to my siblings, or to my parents.

expectations.

The students will be sitting in groups, which may promote a less stressful environment. They will be able to talk to one another easily if they are confused and they can help one another. That being said, they will also have independent work time with quiet so they can focus and think on their own.

If at any point I see students struggling with a specific aspect of this project, I will pause and direct students attention to the board where I will model the process of certain aspects; such as, creating a frequency column, etc. These visuals will remain on the board for students to reference.

Throughout the entire lesson, I will make sure students feel comfortable asking questions and asking for help if necessary. I may either answer those questions on my own, OR I may direct them to a peer who may be able to offer them their thoughts. So, I will be an academic support, but so may my students.

The students' textbooks and math journals can also be used a reference tools if they are having a hard time understanding particular topics.

<p>If you decide to do that, MAKE SURE you remember to bring it back tomorrow. We only have tomorrow to present, so if you forget your poster, you wont be able to present. Got it?! Okay..”</p> <p><i>(About 10 minutes)</i></p> <ul style="list-style-type: none"> <li>• <b><i>Transition to next learning activity</i></b> When our time is up, I will have the students put their things away and the quietest row can line up for Library.</li> </ul>	
<p><b><i>Assessment</i></b> I will be using my formative assessment strategies to assess student learning on Day 2 of this activity (Similar to Day 1). I will observe and listen to the ways in which students create their tables, graphs, and how they find mode, median, mean, and range. I will look for correctly constructed frequency tables with cumulative frequency columns. I will look for correctly constructed graphs (either bar graphs, OR line plots), and I will look for students to be correctly finding and recording the mean, median, mode, and range. I also want students to be respectful of their peers, which means answering questions politely and keeping the noise level to a minimum so everyone can work, and helping one another if they are confused.</p> <p>Depending on what I see, I may need to alter my lesson as I go. If I notice students having a hard time creating their frequency tables, I will direct the class’s attention to the front board where I will model this process. If I notice students have a hard time transferring their information from the table to the graph, I will model this process as well. If I notice students having a difficult time finding mode, median, mean, and range, then I will review these definitions with the class. If this still doesn’t clear up the confusion, I will model the process of finding these terms on the front board. I may have to move certain aspects of my lesson to the next day if I have to take this kind of time. Thankfully, we have a long class period allotted for math on Thursdays, so I should be able to respond to misunderstandings and still give students the time to finish their posters. If they don’t, it will be homework. Another way I will be assessing is through close listening as students ask questions. If a majority of the class has the same question, then I will take time to review that concept.</p>	<p><b><i>Academic, Social, and Linguistic Support during assessment</i></b></p> <p>During the assessment, I will utilize notebook paper to take notes, and I will record my observations of what students understand, or misunderstand. These notes will be referenced later in order to better accommodate my teaching and enable me to adapt my lesson where necessary.</p>

## ***High-Level Task Lesson Plan: DAY 3***

**Date:** (Tentatively) November 12<sup>th</sup>, 2010 (Friday)

***Overall lesson topic/title and purpose:***

My lesson topic/title is: “Make a Graph!” and the purpose of this lesson is to create an opportunity for students to display the skills they have acquired throughout Unit 6: Collect and Organize Data. (Total Lesson Time: 1 hour)

***Rationale:***

This lesson is worthwhile because it directly relates to the State of Michigan’s Grade Level Expectations (GLCEs). By the end of this lesson, students will:

- **D.RE.04.0:** Construct tables and bar graphs from a given set of data.
- **D.RE.04.02:** Order a given set of data, find the median, and specify the range of values.

This lesson will give students the opportunity to participate in a high-level task that enables them to “do mathematics”. The process of creating a survey question, collecting and recording data, creating a graph, finding mean, median, mode and range, and then presenting their findings is a multi-step process that requires critical thinking, meta-cognitive abilities, and problem solving strategies; skills that are essential in the “real world”, and in later grades.

***Goals/Objectives for today’s lesson (DAY 3):***

1. Students will be able to communicate mathematical thinking coherently and clearly to peers, and teachers.

***Materials & supplies needed (DAY 3):***

- Students’ Posters

***Procedures and approximate time allocated for each event***

• **Introduction to the lesson**

“For the past two days you all have spent a lot of time working on your final project for our graphing unit. You’ve created survey questions, collected and recorded data, made tables, graphs, and you’ve found the mode, median, mean, and range of your data. I’m very impressed at how hard you’ve all been working. So today, you will have the chance to present your posters to me, and to your peers. Does everyone have your poster with you? (If students don’t, they can either get them out of their lockers, or if they forgot them, then they are out of luck and I will talk to them after class).

*(About 8 minutes)*

• **OUTLINE of key events during the lesson**

(Next I will explain how this will work...) “First, do we have any volunteers to go first? (If no one volunteers, I will draw

***Academic, Social and Linguistic Support during each event:***

I will also be available as an academic resource for my students. I will be able to answer questions and provide feedback for students whenever necessary.

I will explicitly describe the lesson objectives for the students. By offering explicit instruction on my objectives, the students will have no confusion as to what is expected of them.

Throughout the entire lesson, I will make sure students feel

<p>names).</p> <p>Then, for the next 40 minutes, the students can present their posters. When each student is done presenting, I will open the floor for their peers to ask questions. I will also ask them questions; such as: “How did you decide on your survey question?” or “Will you explain how you got mode? Median? Range? Mean?” Etc. This will occur for every student.</p> <p><i>(About 40 minutes)</i></p> <p>• <b><u>Closing summary for the lesson</u></b></p> <p>When our 40 minutes is up, I will get the students’ attention and quiet by: “5-4-3-2-1-0”. At zero everyone will have his or her attention on me, and sitting quietly.</p> <p>(At this point, I will either thank them for their good behavior or explain why I’m disappointed in their behavior).</p> <p>“Thank you, everyone, for sharing your posters. They are amazing! I will be hanging these up in the hallway for your fellow schoolmates to see. Does anyone have any questions?”</p> <p>“Will each table group please collect your posters for the group and leave them in the center of the table and I will come around and pick them up. Make sure your name, date, and student numbers are on the back of your poster.”</p> <p><i>(About 5-10 minutes)</i></p> <p>• <b><u>Transition to next learning activity</u></b></p> <p>When our time is up, I will have the students put their things away and the quietest row can get their things out of the mailboxes and get their backpacks, etc.</p>	<p>comfortable asking questions of their peers by modeling this process.</p> <p>The students posters will also act as a support for them to reference as they present their findings.</p>
<p><b><i>Assessment</i></b></p> <p>For day 3 of this lesson, I will be closely observing how well the students are able to communicate their mathematical ideas. I will listen for the definitions of mode, median, mean, and range, I will listen for their decision making process in creating a survey question, and I will listen for their description of why their information and graph is important. Once the class’s presentations are complete. I will collect their posters and grade those as their summative assessment. I will look for a frequency table that includes a cumulative frequency column. I will look for correctly constructed bar graphs or line-plots. I will look and</p>	<p><b><i>Academic, Social, and Linguistic Support during assessment</i></b></p> <p>During the assessment, I will utilize the notes I took throughout this three-day lesson, and I will reference the students’ posters.</p>

make sure their graphs are correctly labeled. I will also look for the correct labels of mode, median, mean, and range. Finally, I will make sure the student has included a sentence or two explaining what their graphs mean.

I also want students to be respectful of their peers, which means asking questions politely and keeping their voices off so everyone can listen to the presentations.

Depending on what I see, I will grade students accordingly.

## **SECTION SIX: PARENT INVOLVEMENT AND COMMUNICATION**

My plan for parent involvement is as follows:

- I will send students home with a detailed description of a card game they can play at home that will further deepen their understanding of Mean, Median, Mode, and Range.
- I will include information regarding this unit and what students will be learning in our monthly newsletter.
- I will send notes home with students if I notice they need extra help with understanding a particular concept and I will ask parents to go over their homework with them.
- If a student did something extremely well, helped his or her classmates, or made a vast improvement in a specific skill set, I will make sure to inform their guardian by sending home a note.