

Math Unit

Big Ideas

Different types of graphs and visual representations of data can impact how well and what data is understood.

Graphs are a way of organizing data and they appear in newspapers, magazines, on the Internet and other places in everyday life.

Graphs need to be interpreted in order for them to have meaning.

Graphs can be used to compare related data.

GLCES

D.RE.04.01 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.

Standards for Mathematical Practices

Construct viable arguments and critique the reasoning of others. I chose this because my students are having trouble explaining their work and never seem confident in what they are doing. I also think that it is also just a great life skill to critique the reasoning of others. You should not always believe what others say; you need to think for yourself and come up with your own ideas. I plan on supporting my students in this by having them always explain why they do what they do and have classroom discussions where students can interact with each other to understand math tasks. I will also make sure to observe students while they work, so I choose the right students to make sure the discussion goes in the direction to achieve our goals.

Learning Targets

Students will be able to understand how to conduct a survey and record data.

Students will be able to interpret data from a frequency table.

Students will be able to find the mean, median and mode from data in tables.

Students will be able to interpret data from a line plot.

Students will be able to make a stem-and-leaf plots to organize data.

Students will be able to interpret information from a pie chart.

Students will be able to compare graphs—both the physical looks and the data.

Students will be able to define bar, bar length and bar height.

Students will examine the procedure for constructing a bar graph from a given set of data.

Formative Assessment

- White Boards – My students love using white boards, and they already know how to use them appropriately. Using these for students to write answers to graph question will be a quick way for me to see who understands the concept. Students won't be stressed or feel like they are being tested because white boards are so much fun.

- Anecdotal Notes – During discussions and when students are working independently or in groups, I will observe which students are distracted, which ones are on task, which ones are talking, using manipulatives, working with others, etc. and write down notes. Also, I will closely look at student work and make anecdotal notes. I think that these notes are a great system to use to keep track of individual student growth.
- Conferencing – I will visit each group/student and talk to students about the math work. I will ask questions to extend students’ thinking, such as asking how they solved the problem and their thoughts. I will try to conference with each student at least twice a week.
- To keep track of individual student growth, I will also compare their scores on each individual part of the pre-assessment to the work done in class to see if they are improving. For example, if they complete homework on stem-and-leaf plots, I will compare their work to how well they did on the stem-and-leaf plot question on the pre-assessment.

Summative Assessment

Collecting & Organizing Data Test

1. *Big Idea: Graphs are a way of organizing data and they appear in newspapers, magazines, on the Internet and other places in everyday life.*
GLCE: D.RE.04.01 Construct tables and bar graphs from given data.
Learning Target: Students will be able to understand how to conduct a survey and record data.

You are very interested to see what your classmates’ favorite sport is. Write a survey question, with choices, to find out this information.

Choice 1: _____

Choice 2: _____

Choice 3: _____

Choice 4: _____

Choice 5: _____

2. *Big Idea: Different types of graphs and visual representations of data can impact how well and what data is understood.*
GLCE: D.RE.04.01 Construct tables and bar graphs from given data.

Learning Target: Students will be able to interpret data from a frequency table.

You took a survey of your classmates to see what their favorite ice cream flavor is. You found that 3 people like vanilla, 5 people like chocolate, 2 people like strawberry, 3 people like cookies and cream, 7 people like chocolate chip cookie dough and 3 people like mint chocolate chip. Organize this data into the frequency table below.

Favorite Ice Cream Flavors

Ice Cream Flavors	Frequency	Cumulative Frequency

2. *Big Idea: Graphs need to be interpreted in order for them to have meaning.*

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target: Students will be able to find the mean, median and mode from data in tables.

You and four friends compared how many King-size candy bars you got Trick-or-Treating on Halloween. The table below shows how many each of you received.

King-Size Candy Bars

Person	You	Friend 1	Friend 2	Friend 3	Friend 4	Friend 5	Friend 6
# of King-Size Candy Bars	7	4	2	1	0	3	4

What is the mean (or average) of number of candy bars received? Show your work.

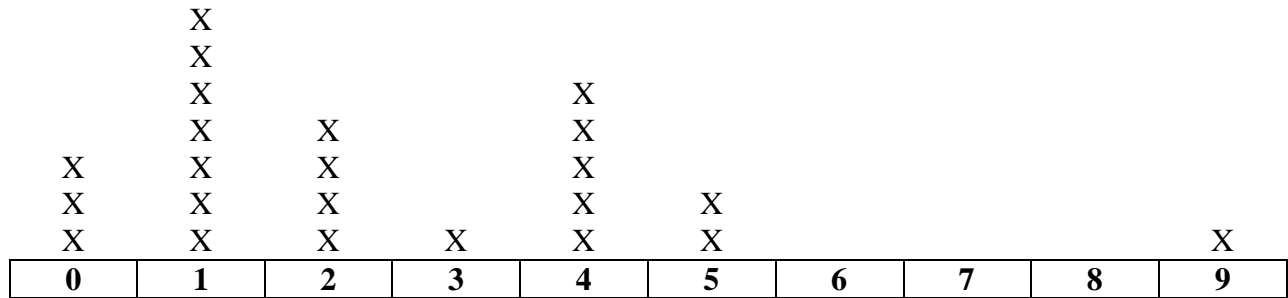
What is the median of the data? Show your work.

What is the mode of the data?

4. **Big Idea:** Graphs need to be interpreted in order for them to have meaning.
GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target: Students will be able to interpret data from a line plot.

It's popcorn day! You can buy as many bags of popcorn as you want. We wanted to see how many bags of popcorn students bought. Here are the results in a line plot.



Number of Bags of Popcorn Bought

Each X in this line plot stands for one student. What do the numbers on the line plot stand for? _____

What value would be considered an outlier?

What is the range of the number of bags of popcorn bought?

What is the lowest and highest spelling test scores?

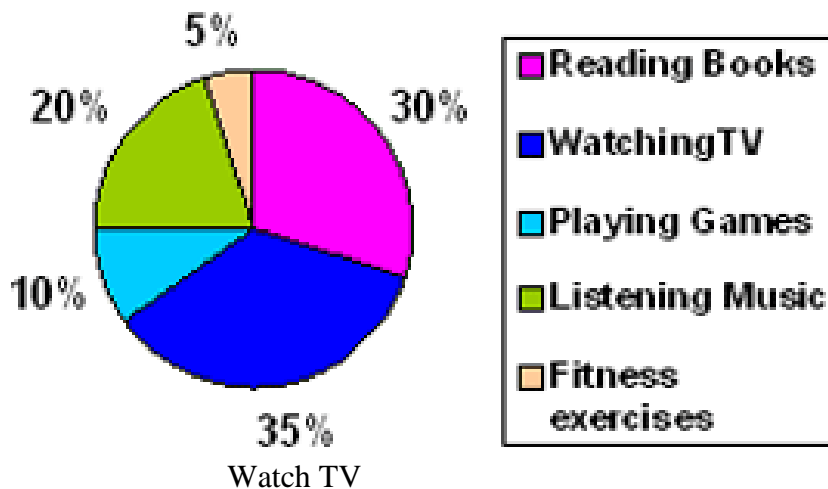
Lowest: _____ Highest: _____

What is the mode (most)? _____

What is the median (middle)? _____

6. **Big Idea:** *Graphs need to be interpreted in order for them to have meaning.*
GLCE: 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.*
Learning Target: *Students will be able to interpret information from a pie chart.*

We took a survey to see what Mt. Hope students' favorite hobbies are. Here are the results:



What percentage of students like playing video games the best? _____

How many more students like watching TV than playing sports? _____

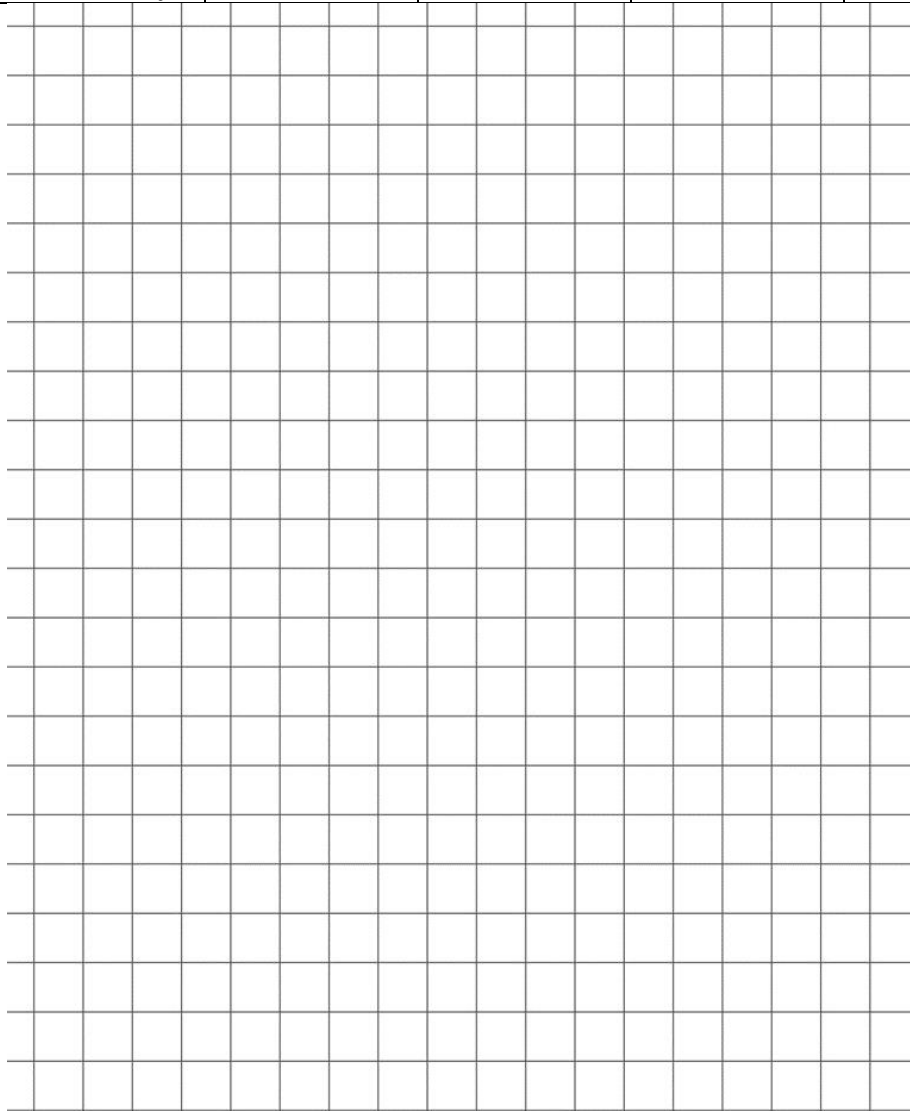
Do more or less than half of the students like reading? _____

Do more or less than a quarter of the students like listening to music? _____

7. **Big Idea:** Graphs can be used to compare related data.
GLCE: 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.
Learning Target: Students will be able to compare graphs—both the physical looks and the data.
 Students will be able to define bar, bar length and bar height.
 Students will examine the procedure for constructing a bar graph from a given set of data.

Make a bar graph using this information:

Candy Received for Halloween					
Candy	Reese's	Kit Kat	Twix	Milky Way	Suckers
How many	16	11	7	3	12



Differentiation Strategies

- Grouping based on achievement level – Throughout my lessons, I plan to do a lot of group work. I will alternate how I divide up groups based on achievement level. I will use the pre-assessment data in addition to what I already know about the students to determine the students' achievement levels. Sometimes, I will group students together who are around the same level so that no one is 'taking over' in the group and doing all the work. Also, it will give me time to sit down with the lower students so they can have more guidance while the higher students can work more independently in their groups. I will also sometimes divide the students so that there are a variety of levels in one group. I think that this will be beneficial because the lower students will be guided by the higher students and see how they think through the problem and the higher students will have to explain their thinking to the lower students, which helps them check to see if they really understand it and makes sense.
- Using manipulatives – I will provide manipulatives for all students to use during solving the math tasks. They will be optional to use so that the higher level learners won't have to use them if they don't want to but will be there for the lower level learners to use. Manipulatives are a great way to visually think and solve a task, which will be a useful aid for those who have trouble doing things mentally. Everyone has different levels of smartness when it comes to math, so the manipulatives will help students with those who think differently and need a concrete and visual aide to understand the concepts.
- Extending the math task – For those who get done early with the math task, I will have a mini task/question that will further and challenge their thinking. Therefore, these students will not be bored and result in behavioral issues. Also, if I notice that some students are really struggling with the task, I will have questions prepared that will make the problem easier for them to think about without reducing the learning targets and expectations of the lesson. For example, using simpler numbers in the task.

Students with IEPs and Other Special Needs

There are a couple students who have ADHD and are distracted easily. I think that working in groups will be good for these students. This way, they are not confined to having to sit still and listen to someone speak. Instead, they will be able to move around and talk to the other students in their group. Also, the math tasks will be interactive, so hopefully this will keep their attention.

I also have three students who are special education. One has autism and speaks out a lot and refuses to do writing work. Therefore, for this student, I will focus more on his participation and thinking while he is in the groups rather than the written requirements of the assignments. He is very intelligent, so I will not lower the requirements for him. One of the other students will not follow along with anything throughout the day and when it is time to work, he just sits there and doesn't know what to do. For this student, I plan on checking on him frequently throughout group work to make sure that he is participating and have separate conversations with him to make sure that he understands what is going on. The other special education student is always very engaged in class and always does his work, but he rushes through it and usually does not understand it. For him, I will make sure to let him know that it is not a race and if he does finish quickly on assignments and tasks, I will check it over and have him redo it if necessary. Also, I

think that group work will be good for him because then he cannot rush through it on his own and must work at the same pace as the other students.

Project 1

In Project 1, I learned a lot about the students and their interests. I plan to incorporate these interests into my math tasks so that they will be more engaged in the lessons. Also, I would like to incorporate activities that involve their own community so that they realize math is used more than just at school and is important in everyday life. It will also show them that math is not abstract and meaningless. I would like to change students' perspectives on what it means to be smart. Most of the students think that to be smart in math, you must be fast and be able to memorize facts and procedures. I would like them to see that to be smart in math, those abilities are not necessary and that critical thinking and problem solving are more important. When planning my unit, I will make sure to include problems that make this very apparent, so the students that do have great critical thinking and problem solving skills will see themselves as smart and help their confidence in math.

Date: Monday, October 21, 2013

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to understand how to conduct a survey and record data.

Students will be able to interpret data from a frequency table.

Rationale:

Surveys are very important in the business world to get feedback from customers and employees about certain issues. Also, surveys let you know the actual need of customers and employees and help you to know the facts. I will work to make this relevant to my students by incorporating their interests into the math tasks and use scenarios that could actually take place in their current lives.

Brief description/overview of lesson:

In this lesson, students will be told that they are in charge of a fundraiser for their fourth grade camping trip. First, we will talk about the importance of selling things that other students will want to buy. Then, we will brainstorm how we could figure this out, and if it doesn't come up, I will ask if they have ever heard of a survey and what they think it is. The students will then be put into groups with varied abilities of students in each group. Students will be asked to come up with a survey that will help them figure out what they should sell in their fundraiser. They will be given paper to write down their questions and choices. We will then come back as a whole class to discuss each group's survey (what is good and bad about it) and choose the one that will work the best. Then as a class, we will discuss how we will conduct the survey (by raise of hands, tallies, write down answer, ask each individually, etc.) and record the data. I will introduce the vocabulary words *frequency* and *cumulative frequency* during this time and discuss why it is important to organize our data. With our chosen way, we will conduct the survey and record the data in our frequency table. Finally, we will interpret the data from the frequency table and decide on what would be the best thing to sell for our fundraiser.

Materials:

- Paper for each group
- Pencil for each group
- Class white board & marker

Plans for Formative Assessment:

I will use anecdotal notes and conferencing. This will be the first time that students work in groups this year, so I will be walking around to see who works well in group settings and is engaged and giving their input to the group and which ones are sitting back and off task. I will be taking anecdotal notes on these behaviors. I will also be conferencing with specific students and groups as a whole to clarify their thinking and see if they understand the concept of surveys and take anecdotal notes on which students understood it and which ones need further support.

Daily Reflection:

My first lesson went very well. When I told them that we were going to have a fundraiser for fourth grade camp, they were really excited and got really into it. A lot of students were already familiar with the term 'survey' but most of them could not tell me what it meant. When I asked them how to choose a movie for movie day, one student said we could vote and another student added that we could vote and students could raise their hands. Then, a student said we could take a survey. I asked what we needed to do to conduct the survey and we discussed how we needed choices. As a group, we decided that 5 choices would be best. For the fundraising activity, we first brainstormed choices, and went over what was necessary to have in the survey. The students said that we need a question, title and choices. The students have never worked in groups before, but they did extremely well with moving desks and staying on task. A lot of the groups kept asking me for answers instead of discussing them in their groups, so I asked those groups questions to further their thinking. I could tell that the 'smart' students in the group took over and did most of the work, so next time, I will make sure to assign jobs to each group member. Some groups got done early, so I had them think about a way to conduct the survey. First, I chose a group that did not have a question and only choices. When I showed their survey on the Elmo, one student said that we didn't know what the choices meant and that we need a question. Then, I chose a group that had a question but was not a clear question. We realized that we needed a clearer question, so another group offered to share their question and agreed that it was a good survey question. Then, we looked at the choices groups had for the survey. First, we looked at a group that had 10 choices and decided that that was too many because the data would be too spread out. We looked at a group who had five choices and agreed that this survey would be best to use. We then decided that voting by raising hands would be the best way to conduct the survey. After we conducted the survey, we organized our data in a frequency chart and decided that books would be the best thing to sell for our fundraiser. Overall, I learned that some students understood surveys well while some did not and needed further guidance. During the unit, we will conduct many surveys to gather data so that students will have more exposure to them.

Date: Tuesday, October 22, 2013

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to find the mean from a given set of data.

Rationale:

Finding the mean of a given set of data is important to get an overall understanding of the data you

collected. I will work to make it relevant to my students' lives by incorporating data that they would be interested in working with and coming up with a task that the students could encounter in their lives today.

Brief description/overview of lesson:

First, we will discuss as a group the word *average* and why it is important by looking at given sets of data and averages and which is more beneficial in certain situations. I will then introduce the vocabulary word *mean*, which is usually another word for average. As a class, we will find the average of free throws made during a basketball game. The students will then be put into groups based on achievement level. Each student will get a pack of M&Ms and will be asked to make a frequency table of how many red M&Ms are in each pack. Then they will have to find the average of red M&Ms in a pack. After they find the average, we will come back as a group and discuss how each group found the average and why answers may vary. I will then give the students sets of data and ask them to find the mean individually and have them write the answers on their white boards.

Materials:

- Paper
- Pencil
- Class white board & marker
- Individual white boards & markers
- 23 packs of M&Ms
- 6 calculators

Plans for Formative Assessment:

I will use white boards and conferencing for this lesson. At the end of the lesson to see if they understand how to find the mean, I will ask them to work individually to find the mean of sets of data and write the answer on their white boards. I will also conference the students during group work to check their understanding, especially the low achieving group.

Daily Reflection:

When I introduced the word average, the example that most students gave was average grades. We discussed what average meant, but I could tell that most students still were confused. When we found the average of free throws, there were a couple of students who knew how to find the average, but students were still confused. I decided to move into the group activity hoping that doing it themselves would help them understand how to find the average. First, I told the students we were going to be working with M&Ms, and they went crazy and lost all focus. If I teach the lesson again, I will make sure to not let them know about the M&Ms until after I explain all of the directions. Since I separated the groups with same achievement level students in groups, there was a big difference in the amount of time it took students to find the mean of red M&Ms, but it did work better for each student to have a job within the group. For those who finished early, I had them find the mean of different colors. During the discussion, I had different groups explain what they did and we talked about why everyone did not get the same answer. My field instructor observed me this day, and she jumped in and talked about the likeliness and unlikeliness of having a certain number of red M&Ms in each pack. I could tell that some students were starting to understand mean while others were still lost. Unfortunately, I ran out of time and had to cut my lesson short. Therefore, I will go over mean at the beginning of the lesson tomorrow and incorporate it into my median, mode and range lesson, since they all correlate.

Date: Wednesday, October 23, 2013

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to find the mode, median and range from a given set of data.

Rationale:

Finding the mode, median and range of a given set of data is important because it gives an overall view of the data and an easier way to explain what you found rather than presenting the long list of individual results. I will work to make it relevant to my students' lives by incorporating data that is familiar and interesting to them and create scenarios that could take place in their current lives.

Brief description/overview of lesson:

First, I will draw on yesterday's lesson by having students think back to why the mean can be important when presenting data. Then, I will explain that there are others ways that you can talk about data as well; you can look at the number that occurs most often, the middle number or the range. They will be put into the same groups as yesterday, and I will have them use their frequency tables of red M&Ms from yesterday and will now have to find the most, middle and range (lowest and highest) amount from their data. Then, we will come back together as a class to discuss how groups found these and which one would be most beneficial, including the mean, to use in certain situations. I will then present students with sets of data where they have to use their white boards to find the median, mode or range individually.

Materials:

- Red M&M frequency tables from yesterday
- Paper
- Pencil
- Class white board & marker
- Individual white boards & markers

Plans for Formative Assessment:

I will use white boards and conferencing for this lesson. At the end of the lesson to see if they understand how to find the median, mode and range from a set of data, I will ask them to work individually to find one of these and write the answer on their white boards. I will also conference the students during group work to check their understanding, especially the low achieving group.

Daily Reflection:

I started off the lesson by reviewing the mean. We did a couple of problems together, and then I had them use their white boards to assess their understanding. Most of the students did well with the white boards, but there were still a few students who were not understanding it. First, I explained what each one was and tricks to remember the difference between each. We then used the M&M frequency tables from yesterday to find the median, mode and range. The students did very well with this in their groups. I used different group examples to explain each one. I then taught them the MMMR rap, which they absolutely loved. We practiced this a few times to help them remember what each one meant. I then had them use

their white boards again to see if they understood mean, median, mode and range. I could tell that they still needed more experience with these, so I will use them throughout the rest of the unit while discussing other types of graphs.

Date: Thursday, October 24, 2013

GLCE: 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.

Learning Target(s)/Objective(s):

Students will be able to interpret data from a line plot.

Rationale: It is important to be able to understand line plots because it is a simple way to organize a small set of data that is easy to understand. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, I will ask the students if they remember what frequency means and talk about ways to visually represent data. I will then introduce them to a line plot. Then the students will be separated into groups with varying levels of achievement in each group but different than last time. They will be given a line plot about how many pieces of pizza each person ate and answer questions with their group based on it. We will then discuss the answers as a class and talk about how to interpret a line plot and when they should be used. Then the students will take out their white boards, and I will ask them questions based on the line plots.

Materials:

- Line plot of pieces of pizza ate with questions
- Pencil
- White boards & markers

Plans for Formative Assessment:

I will use white boards and anecdotal notes for this lesson. At the end of the lesson to see if they understand how to interpret a line plot, I will ask them to work individually to answer questions based off a line plot and write the answers on their white boards. I will also take anecdotal notes about the students during group work based on if they were participating and understand the line plots.

Daily Reflection:

This lesson was a little difficult. The students had trouble understanding what the X's meant compared to the numbers at the bottom. They kept thinking that the X's represented the amount of pizza when it really was the number of people. We spent a long time discussing how line plots work and I gave many examples so that they could become familiar with them. It was worth it because in the end, they ended up understanding it. This discussion took so long that I was not able to use the white boards to formally assess them. I did give them homework so that I could see if they really understand the line plots. Based on what I saw today, I will review line plots using white boards in the beginning of the lesson tomorrow to see if I need to spend more time teaching them as a class. Also, I will use the homework to determine

this as well.

Date: Friday, October 25, 2013

GLCE: D.RE.04.01 Construct tables and bar graphs from given data.

Learning Target(s)/Objective(s):

Students will be able to construct a line plot based on a given set of data.

Rationale:

Constructing line plots is important to know because it is a simple way to represent a small amount of data that is easy to understand. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, I will revisit the key components of line plots that we learned yesterday and when we should use them. Then, we will survey the class and make a frequency table based on how many siblings each student has. We will then make a line plot based off the data as a class. Then the students will be separated into groups with the same levels of achievement in each group but different than last time. They will be given a class list and asked to make a line plot based on how many letters each student has in their first name. They will be able to use stickers to make it. After they create their line plot, we will come back as a group to discuss how each group did it.

Materials:

- Class list
- Elmo
- Graph paper
- Pencil
- Stickers

Plans for Formative Assessment:

I will use anecdotal notes and conferencing to assess my students. I will take anecdotal notes about the students during group work based on if they were participating and understand how to make a line plot. I will also conference the students during group work to check their understanding, especially the low achieving group.

Daily Reflection:

First, I used the white boards to assess student understanding on line plots. The students did very well with it, so we moved on to constructing line plots. They loved seeing their own names to work with on the line plot; it kept them interested in the task. I was amazed how well this lesson went. They worked great in their groups and most of the groups made the line plots correctly. One group switched up the numbers on the bottom and the X's, having the X's represent the number of letters and the numbers at the bottom representing the number of people, so we discussed as a class why this was not correct. I believe that everyone felt very confident with how to construct a line plot by the end. Therefore, I will move on with my lesson on stem-and-

leaf plots on Monday.

Date: Monday, October 28, 2013

GLCE: 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.

Learning Target(s)/Objective(s):

Students will be able to interpret a stem-and-leaf plot.

Rationale:

Stem-and-leaf plots are useful when you are trying to organize a large set of numbers. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, we will talk about how stems and leaves relate. Then, I will introduce them to a stem-and-leaf plot and see if anyone has an idea of how to interpret it. We will talk about place value and answer a few questions together based on the plot. Then, students will be divided into groups based on varied levels of achievement and given a stem-and-leaf plot on spelling test scores from Friday. In their groups, they must answer questions about the stem-and-leaf plot, including mean, median, mode and range. Then, we will come back as a group and discuss the answers and why this plot is important. The students will then get out their white boards and I will ask them questions about a stem-and-leaf plot that they will have to answer on the white boards and show me.

Materials:

- Examples of stem-and-leaf plots
- Stem-and-leaf plot on spelling test scores with questions
- Pencil
- Student white boards & markers
- Calculators

Plans for Formative Assessment:

I will use white boards and conferencing for this lesson. At the end of the lesson to see if they understand how to interpret stem-and-leaf plots, I will ask them to work individually to answer questions based on a plot and write the answer on their white boards. I will also conference the students during group work to check their understanding.

Daily Reflection:

During this lesson, there were some groups who really understood the stem-and-leaf plot, while other groups didn't understand it at all. Many groups looked at only the leaf part of the plot and looked at the numbers as only the single-digit number instead of combining it with the stem digit. Therefore, they inaccurately found the mean, median range and mode. We talked about why we would have to look at the stem and leaf to get accurate data because just using one or the other does not represent the actual data. Once students understood how to read the stem-and-leaf plot, we found the median, mode and range together as a class. Then, we used the white boards to assess the students' understanding of how to

interpret the plot. I could tell that some students could do this very easily, while others were still struggling. For some, it was because they still didn't understand how to interpret the plot, while others got median, mode and range mixed up. Therefore, for the next lesson, we will work more on stem-and-leaf plots and review the three M's and range.

Date: Tuesday, October 29, 2013

GLCE: D.RE.04.01 Construct tables and bar graphs from given data.

Learning Target(s)/Objective(s):

Students will be able to make a stem-and-leaf plot to organize data.

Rationale:

Knowing how to make a stem-and-leaf plot is important when you have large amounts of data that needs to be organized. It is useful when you are figuring out the mean, median mode and range of data. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, we will revisit the key components of a stem-and-leaf plot and when and why they are important. Then the students will see how many jumping jacks they can do in one minute, and we will record the data on the board. They will then split up into groups based on same levels of achievement and will have to organize this data into a stem-and-leaf plot and answer questions about the mean, median, mode and range. We will then come back together as a group and discuss the plots and answers to the questions.

Materials:

- Class white board & marker
- Paper
- Pencil

Plans for Formative Assessment:

I will use anecdotal notes and conferencing to assess my students. I will take anecdotal notes about the students during group work based on if they were participating and understand how to make a stem-and-leaf plot. I will also conference the students during group work to check their understanding.

Daily Reflection:

First, we reviewed how stem-and-leaf plots work and how to find mean, median, mode and range. During the discussion, I started out with a group that didn't understand that the stems were the tens place and the leaf was the ones place. They just put some numbers under the stem and some under the leaf. I showed their work on the projector and had other groups to comment on it. A few students questioned why they didn't separate the tens and ones and explained how to do it. This cleared up the confusion on how to separate the numbers. Then I showed a group's work where they didn't clump all the tens together. Some students talked about their mistake and how we could fix this. I then showed a group who didn't put the data in least to greatest and we talked about why it would be easier to read the data if it was in order. We then looked at a group who did the stem-and-leaf plot correctly, and found the median and mode of the

data. Overall, I think that the discussion went well and all misconceptions about the plot were corrected.

Date: Wednesday, October 30, 2013

GLCE: 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.

Learning Target(s)/Objective(s):

Students will be able to interpret and compare bar graphs.

Rationale: Interpreting and comparing bar graphs is an important skill to learn because bar graphs are a very common way to represent data, so you must know how to use them. Also, bar graphs can be very different, so you must understand them to know how to read and compare them. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, we will conduct a survey on the best Disney show and create a bar graph using an online website. We will then discuss the different components of it and how to read it. Then, we will create the same graph except with different intervals and introduce the words *scale* and *interval*. We will discuss the two graphs and which one is easier to read. Then, they will work with partners and will be given a bar graph on favorite places to shop that they will have to answer questions about, including questions about intervals. After, we will discuss the answers to the questions. Then, the students will get out their white boards and answer questions about bar graphs and intervals.

Materials:

- Examples of graphs with different intervals
- Bar graph with questions worksheet
- Student white boards & markers
- Computer

Plans for Formative Assessment:

I will use white boards and anecdotal notes for this lesson. At the end of the lesson to see if they understand how to interpret a bar graph and compare them based on intervals, I will ask them to work individually to answer questions based off a line plot and write the answers on their white boards. I will also take anecdotal notes about the students during group work based on if they were participating and understand the line plots.

Daily Reflection:

This lesson did not go exactly how I had planned because the computer wasn't working. Therefore, we couldn't create our own bar graphs. Instead, I ended up using examples from the book. Although the problems were not as interesting and didn't connect to their lives, they still did the job. We had a great discussion on how you would determine scales and intervals for a graph and how they affect the graph. Students caught onto this quick. This was the first time I had students work with partners, and I really like how it went and the students worked well together. It was a good change from group work because it gave

the students more responsibility. In the future, I definitely want to do more partner work. Students had great conversations about what intervals and scales to use, especially when they disagreed. For example, one group was discussing to either have an interval of 5 or 10 and they each had a good argument. They both stated their arguments and listened to each other without getting frustrated. In the end, one student persuaded the other student to go with an interval of 5. Overall, we had a great discussion about how to decide the scale and interval, although some students got the two words mixed up occasionally. When assessing them using white boards, all students did a great job determining them.

Date: Thursday, October 31, 2013

GLCE: D.RE.04.01 Construct tables and bar graphs from given data.

Learning Target(s)/Objective(s):

Students will be able to make a bar graph from a given set of data.

Rationale:

Bar graphs give a visual representation of numerical data that is easy to read. They are useful when you are presenting information to someone else to compare different variable. I will work to make it relevant to my students' lives by incorporating data for the plot that interests them and use scenarios that could happen in their lives right now.

Brief description/overview of lesson:

First, we will revisit the key components to a bar graph and the importance of choosing intervals. Then, we will conduct a survey on the best gaming device (Xbox, Wii, Play Station, DS, etc.). Then, in groups based on varying abilities, they will make a bar graph of the data. We will come back as a class to discuss what each group did.

Materials:

- Class white board and marker
- Graphing paper
- Pencil

Plans for Formative Assessment:

I will use anecdotal notes and conferencing to assess my students. I will take anecdotal notes about the students during group work based on if they were participating and understand how to make a bar graph. I will also conference the students during group work to check their understanding.

Daily Reflection:

The students seemed most familiar with this representation of data out of all of them that we have learned so far in the unit. They told me that they see these a lot in newspapers and online. They also mentioned that they made one earlier in the year (which we did, but they were told step by step what to do). Therefore, I didn't teach so much in the beginning as review what was needed on the bar graph. We did look at an example to start, and the students seemed pretty confident with what to do, so we got right into the activity. Most groups made a successful bar graph, but there were a few misconceptions in some groups. The first group we looked at placed the gaming device labels on the y-axis and the numbers on the x-axis. They also used an interval of 10, when our highest data was 11. We talked about some things

that this group could do differently and then moved onto a group that used an interval of 20 for their data. This group had a lot of trouble working together and agreeing on what to do, so they spent most of their time arguing. I know next time not to put those students in a group since they cannot get along. As a class, we discussed why 20 would not be the best interval to use, and that 1 or 2 would be the best interval to use. Most groups understood how to make the bars for the bar graphs and just forgot to put labels on the x- and y-axis. I feel confident that my students can successfully make and interpret a bar graph.

Date: Friday, November 1 & Monday, November 4, 2013

GLCEs:

D.RE.04.01 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.

Learning Target(s)/Objective(s):

Students will be able to understand how to conduct a survey and record data.

Students will be able to interpret data from a frequency table.

Students will be able to find the mean from a given set of data.

Students will be able to find the mode, median and range from a given set of data.

Students will be able to interpret data from a line plot.

Students will be able to construct a line plot based on a given set of data.

Students will be able to interpret a stem-and-leaf plot.

Students will be able to make a stem-and-leaf plot to organize data.

Students will be able to interpret and compare bar graphs.

Students will be able to make a bar graph from a given set of data.

Rationale:

I will be reviewing for the assessment that they will be taking on this unit. For the review, I am giving them a lot of choice, so I believe it will help them stay engaged and be relevant to their lives.

Brief description/overview of lesson:

In groups of varying levels, students will create their own survey but the results must be numerical. Then, we will come back as a class and conduct each group's survey and the group will record the data. Then, they will get back in their groups and decide on the best way to represent and organize their data. From their data, they will have to find the mean, median, mode and range and answer other questions about the data. Then, each group will share what they did and why.

Materials:

- Paper
- Graph paper
- Pencil
- Stickers
- Calculators

- Elmo

Plans for Formative Assessment:

I will use conferencing and anecdotal notes. While the groups are working, I will conference with students to make sure that they understand what is going on and understand the concepts. I will also take anecdotal notes on who is participating and what they are doing and saying.

Daily Reflection:

This review lesson was chaotic! Students were so confused on what to do at first. Since it was so open and they had a lot of decisions to make on their own, they were very confused. If I were to teach this lesson again, I would break the lesson into more parts, so that they were only given a few directions at a time. Also, I would probably make this a 2-day task because it was very rushed with only an hour. Once the groups understood what they were doing, they got very into it. The groups conducted surveys on favorite color, food, football team, subject, fruit and candy. It took awhile to conduct all of the surveys, but I think that the students really enjoyed it. They had a hard time coming up with a way to organize their data. In the end, all the groups except the favorite football team group did bar graphs. The football group did a pie chart. First, we talked about the bar graphs, since most groups did that. All of the groups did an excellent job with the bar graphs, but just forgot little things like labels and the title, but overall understand how to represent data with one. Then, we talked about the football group's pie chart. We talked about how they made it and if the bar graph or the pie chart was a better way to represent the data and decided that they are both good ways. Then, we talked about if we could represent the data using a line plot, and we agreed that we could. Then, we discussed out we couldn't use a stem-and-leaf plot because we have choices in our data. We also talked about how we could use a frequency chart. Overall, I really liked this lesson because students had to use a lot of higher level thinking and helped them understand the reasons for these representations of data.

Section 5: Detailed Lesson Plans

Date: Monday, October 21, 2013

Overall lesson topic/title: Collecting and Organizing Data

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to understand how to conduct a survey and record data.
Students will be able to interpret data from a frequency table.

Rationale: Surveys are very important in the business world to get feedback from customers and employees about certain issues. Also, surveys let you know the actual need of customers and employees and help you to know the facts. I will work to make this relevant to my students by incorporating their interests into the math tasks and use scenarios that could actually take place in their current lives.

Materials: (Include a copy of any handouts you will be using):

- Paper for each group
- Pencil for each group

- Class white board & marker

Procedures and approximate time allocated for each event

LAUNCH: Introduction to the Lesson (10 minutes)

I will ask them if they have ever wanted to know what the most popular of something was or if they ever have been a part of a survey. We will discuss student responses, and talk about surveys as ways to get to know the interests of others and what they thought about a particular situation. They are used a lot in the business world with customers, so businesses know what to provide to make their customers happy. Then, they will be told that they are going to run their own business and have a fundraiser for their fourth grade camping trip. We will talk about the importance of selling things that other students want to buy and how a survey would be a good way to figure out what other students would most likely buy. We will talk about some of the key components of a survey, and then will be told that it is their job to create a survey to figure out what would be best to sell. Then, we will brainstorm categories of things to sell as a class. I will tell them that they must come up with one survey question with choices. I will explain that they will be working in groups, but I will be choosing them. I will go over the expectations for working in groups (quiet, on task, respectful, etc) and show them how to move their desks since they are currently in rows. I will then have them move seats and have the paper passer distribute one piece of paper for each group to work with.

EXPLORE: Outline of Key Events During the lesson (15 minutes)

During the explore part, students will be working in groups with varying levels of abilities in each group. I anticipate that some students will ask a question without providing choices. I also anticipate that students will have varying amount of choices. Also, some students' choices will not match up with what their question is asking. I will go around and monitor as the students are working to make sure that they are on task and headed in the right direction with the survey. I will also take note of how groups are performing the task so that I can sequence the discussion in a thoughtful way. If students finish early, I will have them write down different ways to conduct the survey. If students are struggling, I will make sure there is an adult with their group helping them out. Also, the brainstorming that we did ahead of time should help them out.

SUMMARIZE: Closing Summary for the Lesson (35 minutes)

We will then come back as a whole class to discuss the surveys. During the discussion, I will first look at a group whose does not have a clear question. Then, I will bring attention to a group who has a good question but no choices. Then we will discuss the groups who have choices but discuss how many choices would be best to have. We will discuss the key components of a survey (clear question, number of options, etc.). During this time, I will have students clarify each others' thinking, so that I know they understood it and are actively listening. Then, as a class, we will discuss how we will conduct the survey (by raise of hands, tallies, write down answer, ask each individually, etc.) and record the data. I will introduce the vocabulary words *frequency* and *cumulative frequency* during this time and discuss why it is important to organize our data and how we can do that using a frequency table. With our chosen way, we will conduct the survey and discuss and record the data in our frequency table. Finally, we will interpret the data from the

frequency table. I will do this by asking the students what would be the best thing to sell according to our data, what should we not sell and why. In the end, I will ask students based on popsicle sticks the importance of the key components of a survey. Finally, I will ask if there are any questions.

Description of Formative Assessment

I will use anecdotal notes and conferencing. This will be the first time that students work in groups this year, so I will be walking around to see who works well in group settings and is engaged and giving their input to the group and which ones are sitting back and off task. I will be taking anecdotal notes on these behaviors. I will also be conferencing with specific students and groups as a whole to clarify their thinking and see if they understand the concept of surveys and take anecdotal notes on which students understood it and which ones need further support. I will specifically look at students who did not get this question right on the pre-assessment and see if they are understanding it now.

Date: Tuesday, October 22, 2013

Overall lesson topic/title: Finding the Mean

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to find the mean from a given set of data.

Rationale:

Finding the mean of a given set of data is important to get an overall understanding of the data you collected. I will work to make it relevant to my students' lives by incorporating data that they would be interested in working with and coming up with a task that the students could encounter in their lives today.

Materials:

- Paper
- Pencil
- Class white board & marker
- Individual white boards & markers
- 23 packs of M&Ms
- 6 calculators

Procedures and approximate time allocated for each event

LAUNCH: Introduction to the Lesson (20 minutes)

I will ask them if they have ever heard of the word average before and what they think the word means. Then we will look at sample sets of data and their averages and decide which is more beneficial in certain situations. I will then introduce the vocabulary word *mean*, which is usually

another word for average. I will then choose 5 students to pick a number 1-10 and these are going to be how many free throws they made during a basketball game. As a class, we will first predict what the average might be and then we will find out the average of free throws made by adding up the five numbers and dividing the total by five. I will explain that this is how you would find the average. Then they will be put into groups with the same level achievement students in the same group. I will ask students to remind everyone of the rules during group work. Then I will explain that we will be working with M&Ms and they will be able to eat them, but not until they record their data about them. I will also tell them that the M&Ms stay on the desk and should not be thrown around or touching other students'. I will tell them that in their groups, they will be finding the average amount of red M&Ms in a pack of M&Ms. We will revisit the idea of a frequency table and be asked to make one for only the red M&Ms. After they make this table, they may eat them but must still stay on task and work. I will ask them to make sure they show all of their work. To make sure of this, I will be monitoring the groups as they work and remind students if they are not showing their work that it is required. I will have the paper passer pass out paper to all of the groups and I will pass out the M&Ms. I will tell them that they are allowed to use calculators for the division part since they do not know how to do long division, but I want to see their work for the rest of it.

EXPLORE: Outline of Key Events During the lesson (20 minutes)

The students will be working in small groups. If students finish early, I will ask them to find the average of a different color of M&Ms. If students are having trouble, I will ask them to find the average of red M&Ms for only two packs at first and work their way up. While the students are working, I will be monitoring the groups and writing down notes on the way each group is solving the problem. When most students are done finding the average, we will come back as a whole class and discuss. First, I will ask a group to share that did not do the frequency table correctly, if any. Then, I will have a group that didn't finish to share and other groups to add on. We will talk about why answers may vary but still be correct as well. In the end, we will determine that answers will vary because everyone has different data because there is not the same amount of red M&Ms in each pack. Every group will add to the discussion. Then, students will take out their white boards, and I will put sets of data on the Elmo. The students will find the means individually, which will be an assessment for me to find out if they understand the

SUMMARIZE: Closing Summary for the Lesson (20 minutes)

The students will take out their white boards, and I will put sets of data on the Elmo. The students will find the means individually, which will be an assessment for me to find out if they understand the concept of finding the mean. If there are several students who get the answer wrong, then I will go over it with the class. In the end, I will ask them to either put their thumbs up, down or in the middle to tell me how confident they feel about finding the mean.

Description of Formative Assessment

I will use white boards and conferencing for this lesson. At the end of the lesson to see if they understand how to find the mean, I will ask them to work individually to find the mean of sets of data and write the answer on their white boards. I will also conference the students during group work to check their understanding, especially the low achieving group.

Date: Wednesday, October 23, 2013

Overall lesson topic/title: Median, Mode & Range

GLCE: D.RE.04.02 Order a given set of data, find the median, and specify the range of values.

Learning Target(s)/Objective(s):

Students will be able to find the mode, median and range from a given set of data.

Rationale:

Finding the mode, median and range of a given set of data is important because it gives an overall view of the data and an easier way to explain what you found rather than presenting the long list of individual results. I will work to make it relevant to my students' lives by incorporating data that is familiar and interesting to them and create scenarios that could take place in their current lives.

Materials:

- Red M&M frequency tables from yesterday
- Paper
- Pencil
- Class white board & marker
- Individual white boards & markers

Procedures and approximate time allocated for each event

LAUNCH: Introduction to the Lesson (10 minutes)

The following questions are provided to help you think about what you might include:

First, I will ask the students if they remember what the importance of finding the mean is and give examples of when you would want to find it. Then, I will explain that there are other ways to summarize data, and it depends on what you are trying to portray in deciding how you will summarize it. First, I will introduce median as the middle number; we will talk about how you would find it and when it would be a good time to use this to summarize data. Then, we will talk about mode as the 'most' and when it would be a good time to use this. Finally, we will talk about range and when it is most useful. We will come to the conclusion that range is most useful when you are trying to see what the highest and lowest numbers are in the data. For example, if you want to know the highest and lowest scores on a test. I will then tell them that they will use their frequency tables from yesterday to find the median, mode and range of red M&Ms. They will be working in the same groups as yesterday because they will be using the data that they gathered yesterday with their groups. I will once again remind them of how to behave in groups and what I expect from them. Once in their groups, I will pass out their frequency tables and the paper passer will pass out paper to each group.

EXPLORE: Outline of Key Events During the lesson (35 minutes)

The students will work in small groups again during the work time. For those groups that finish

early, I will extend the lesson by having them think about which summary of data would be best if we wanted to know how many red M&Ms are in a pack. For the groups that are struggling, I will have my mentor teacher or I helping them think through the problem and ask questions that will further their thinking. While they are working, I will be monitoring the groups and taking notes on how each group is solving the problem and which groups got the correct answers. When they are done, we will come back as a whole class to discuss our solutions. First we will discuss median, then mode, then range. When we talk about the median, I anticipate that students may forget to order the numbers from smallest to largest before finding the middle number, and this will be the first thing we talk about in the discussion. Also, if there is an even amount of data, students may just choose one or the other middle numbers instead of finding the average of the two middle numbers. Therefore, we will talk about this next. With the mode, I anticipate that some students will find the biggest number instead of the number that is seen most often, so we will talk about this next. With the range, once again, they may not line up their numbers from smallest to largest, so we will address this next. After, if there is a group that gave the smallest and largest number but did not subtract them, we will discuss this next. After, we will talk about making sure that you subtract the lowest number from the highest number and not the other way around. Throughout the discussion, I will have students explain their understanding to others and have other students' explain what someone else said to make sure they understand it. Then, I will ask the students which form of summary of data would be best if we wanted to know how many red M&Ms are in a pack. I will have them first think by themselves, then discuss with the person they are sitting next to, then we will discuss as a whole group. We will come to the conclusion that mean would be the best in this situation.

SUMMARIZE: Closing Summary for the Lesson (15 minutes)

To assess the students on their understanding, I will have them use their white boards. I will put sets of data on the Elmo, and they will have to write down the median, mode and range of the data. If there are several students who do not understand, I will solve it with the class. In the end, I will clarify any questions that the students may still have.

Description of Formative Assessment

I will use white boards and conferencing for this lesson. At the end of the lesson to see if they understand how to find the median, mode and range from a set of data, I will ask them to work individually to find one of these and write the answer on their white boards. I will also conference the students during group work to check their understanding, especially the low achieving group.

Write about what your students did and did not learn.

Throughout the unit, my students learned how to represent data in visual ways, including frequency tables, line plots, stem-and-leaf plots, pie charts, and bar graphs. On the summative assessment, they were required to make and interpret all of these different ways, and almost every student did this successfully with an average score of 76% on the assessment. On the pre-assessment, which was very similar to the summative assessment, there was an average score of 22%, so there was a significant increase in their achievement.

They also learned how to use these representations to interpret data and why it is important to know. In each lesson, we talked about the significance of each graph and when we would use in the real-world. For example, we talked about why you would use a pie chart or a bar graph to talk about data instead of just listing all of the numbers. They learned that these are easier and

quicker to interpret and look at. Students used real-world data in their graphs to see that it can be useful outside of school. Also, they learned that summarizing data using mean, median, mode and range can be a lot easier to talk about than looking at a large amount of numbers. For example, in the M&M lessons, we agreed that we would all rather look at one number that sums up all of the data rather than looking at 23 different numbers and trying to figure out what it means. We also talked about using mean to look at grades on report cards rather than putting every single grade from the quarter on the report card. This showed them that data can be collected, interpreted then summarized.

Another important thing that my students learned was how to work in groups. Almost everything they have done in class up until this unit was individual work. They sit in rows, talk to the teacher and are required to be silent otherwise. During this unit, they always worked with their peers to work through a task. This taught them how to work cooperatively, explain their reasoning, and listen to others. They had to agree upon a solution and state their case to convince others.

One learning target that I believe my students could use further instruction on is making pie charts. This is something that I was not planning to address at all during my unit, but my mentor teacher thought that it would be a good idea to at least mention. Because I already had such a full curriculum to teach in 10 days, I spent little time on talking about pie charts and understanding how to read them, but I did not spend any time on teaching them how to make them. This is something I know they will spend more time on in the higher grades, but it is definitely something that is worth understanding in more detail. In my summative assessment, I only focused on reading them and not making them, and students did very well with this with an average of 91% on this part, so the next step would be learning how to construct them.

I also think that my students could use further instruction on median and mode. It seems like a lot of students confused the two of these during the lesson, on homework and on the summative assessment. The average on these was 56%; they know how to find median and mode, but they were confusing the two.

How did you use formative assessment to adjust and differentiate your instruction to maximize student learning? How much did your daily lessons change from your original plans?

I used formative assessment throughout the entire unit. The one that was most beneficial for me was monitoring. Just by walking around the room and observing students told me a lot about how well the students understood the content. If a lot of students were having trouble, I would stop the lesson and clear up the confusions. For example, when the class had to come up with a survey about the fundraiser, almost every group was just sitting there confused. Therefore, I gave an example and modeled what they needed to do and then had them try again in their groups. When they got back to work, they were no longer confused and got straight to work. Also, by walking around the room, I noticed which groups were struggling and would ask them questions to further their thinking or start them out with a simpler problem so that they could work up from that. I would also notice that some groups finished very quickly and were getting off-task, so I would ask them questions that require higher-level thinking and give them more challenging tasks that extended the problem.

Another type of formative assessment that really worked well was the white boards. The white boards helped me to assess students' individual understanding of the content. I could better see which students really understood what was going on during the group work and

discussion and which ones were still having difficulties. I would take anecdotal notes of which students were striving and which ones were struggling. If I noticed that most of the class was struggling, I make sure to review and spend more time with the content as a whole. If it were just a few students who were still struggling, I would ask my mentor teacher to pull these students off to the side to get more instruction with the lesson. I also made sure to let the students know that they needed to ask an adult at home to help them with their homework to get further help. The anecdotal notes really helped me keep track of students' progress; I just kept a note pad with me and jotted down students that stood out to me during the lesson whether it was because they were understanding the concepts or were struggling with them. My grade book with all of the students' homework grades was also a great system that I used to keep track of individual student growth.

What did you learn from the results of your summative assessment? Explain any adjustments you made to the original version of your summative assessment.

I learned that overall, the students have a good understanding of collecting and organizing data with an average of 76% on the summative assessment. There were two students who failed the test and therefore, they need further instruction with the unit. We will keep going back to these concepts in future units, so it is important that they learn this stuff. When we use these again, I will make sure that my mentor teacher or I work with them individually to help them master these concepts. I also learned that my students had the most difficulty with mean, median, mode, range and remembering small details when making a bar graph. Many students understand how to find mean, median, mode and range, but they were confusing them with each other and therefore were getting the problems wrong. I could tell that most students really understood how to make/interpret bar graphs but forgot little details like the title and labels, so this brought their score down for the bar graph portion. Overall, my students successfully learned about collecting and organizing data based on the results of the summative assessment.

I made the summative assessment as the unit progressed instead of making it before the unit began to better fit the assessment to what was learned in class. Although we had a plan of what was going on, things don't always go as planned, so I did not want to make an assessment on things that we didn't focus on in class. We did end up covering everything that I wanted to in the unit, and we even added interpreting pie charts into the unit. Most of the students did very poorly on the pre-assessment, so I decided to assess them on everything from the pre-assessment plus I added the pie charts.

Discuss how you would modify your teaching, participation structures, and/ or tasks if you were to teach this unit again to children of the same age.

If I were to teach this unit again to children of the same age, one thing that I would do differently is spend more time teaching mean, median, mode and range the first time. I only planned for two days to teach these four tricky concepts, and it definitely was not enough time. Since I rushed the original lessons and noticed that the students were having a hard time with it, we kept having to do little review sessions to help clarify each of them, and I think that this may be part of the reason students didn't do as well on this part of the summative assessment. If they would've just learned it the first time, I think that there wouldn't have been so much confusion. Therefore, I would probably plan at least one day to teach each of the concepts and one day for just a review of the four together.

Another alteration I would make is to not use M&Ms for a manipulative and use something that is not so distracting. Once my students new that we would be using M&Ms in the lesson, I lost all of their attention. They no longer were listening to directions because they were too excited. Also, once they got the M&Ms, since they weren't listening to directions, some of them started to eat them right away so they had no data to find the mean for. The lesson got chaotic very quickly. Next time, I would use something that is less distracting like blocks.

One other thing that I would like to do more of is partner work. I mostly did group work during the unit, but I found that partner work can be less chaotic and students are given more of a chance to work and be apart of the task. Also, it is easier for me to keep track of who is contributing and who is sitting back.

Reflect on how you used the information you gathered in Project One to help you plan and teach your unit.

In Project One, I learned that my students like to use the internet, play video games, play sports and shop at certain stores. Therefore, I incorporated these things into my tasks, and I believe that this really helped the students stay engaged and interested in the tasks. It also helped them realize why the concepts that we were learning were important to know. I never had a student ask why we needed to know this or moan and groan about what we were doing. For example, I had the students survey and graph their favorite video game console and we used data from a basketball game that some of the students were playing outside. The students loved feeling apart of the lesson and learning things about their classmates, as well. I don't think that the lesson would've been as smooth if I wouldn't have used the information from Project One in my unit; it helped keep the students excited and on-task, and they had a meaning for learning.

Reflect on what you learned about teaching mathematics and about teaching in general.

I learned that teaching mathematics takes a lot more planning than I had thought. I am so used to watching teachers teach straight from the book without planning anything. For example, my mentor teacher will decide what she is teaching the day of and just wing the lessons. From my experience with this unit, if you want to keep the students engaged and teach worthwhile lessons, you must plan ahead. There is so much to think about beforehand, including why it's important, how will you connect it to students' lives, what manipulatives you will use, how will you group the students, what are anticipated solutions, how will you sequence the discussion, etc. You must spend a lot of time planning to create successful math lessons.

I also learned that there will always be students at different levels, and you must differentiate for them. You must not only do it for the low achieving students but also the high level students. If there is no differentiation, then you are only teaching a small portion of the class and the other students are either lost or bored. I learned that the high-achieving students like to be challenged rather than doing work that is too easy for them and the low students get frustrated and give up if the work is too difficult. I also learned that differentiating can be very difficult. It is stressful to know that you must fit the needs of 23 students, but differentiation is the way to do it. However, I am still in the works of mastering this concept, and I think that it will come with experience.

Overall, I learned that mathematics is more than just memorizing facts and procedures and doing abstract problems. Math is fun and exciting and relates to everyday math, and I am

eager to show my students more of this in the future. Doing math in a way that is meaningful and engaging can change how a person feels about math for the rest of their lives, and I hope to help my students look at math in a positive light.