

3rd Grade Unit 6: Real World Experience

It's in the Data

(Teacher version: adapted from Georgia Department of Education GSE Measurement Unit 6)

CONTENT STANDARDS

MGSE3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

MGSE3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

ESSENTIAL QUESTIONS

- How are tables, bar graphs, and line plot graphs useful ways to display data?
- How do I decide what increments to use for my scale?
- How can graphs be used to display data gathered from a survey?
- How can graphs be used to compare related data?

MATERIALS

- “it’s in the Data Part” recording sheet I
- “It’s in the Data Part” recording sheet II
- Plain paper
- Large container of small objects –(e.g. buttons, blocks, marbles, or Unifix cubes, or similar object)
- Chart Paper and Markers
- Ruler/tape measure
- Paper, markers, crayons, rulers and other supplies needed to create graphs
- *Lemonade for Sale* by Stuart J. Murphy

(Reading Rainbow episode available at [138 https://www.youtube.com/watch?v=jTtlavXpNds](https://www.youtube.com/watch?v=jTtlavXpNds))

Task 1:

Introduce this Real World Experience by showing video clip of *Lemonade for Sale*.

Task 2:

Line plot graphs (sometimes called dot plots) are an excellent way to display data in an easy and quick manner. Line plot graphs in third grade are used to record measurement data to the nearest $\frac{1}{4}$ inch.

Students should use the following questions to generate measurement data for a line plot graph:

- How tall are your classmates to the nearest $\frac{1}{4}$ inch?
- What is the arm span of your classmates to the nearest $\frac{1}{4}$ inch?
- How long are your classmates’ hands from the tip of their finger to their wrist to the nearest $\frac{1}{4}$ inch?

Once students have created their own line plot graph, they can discuss what the data tells them in their small groups and then a class discussion can be held where student groups are able to share their thinking.

Task 3:

Students will follow the directions below for the "How Many in a Handful?" student recording sheet.

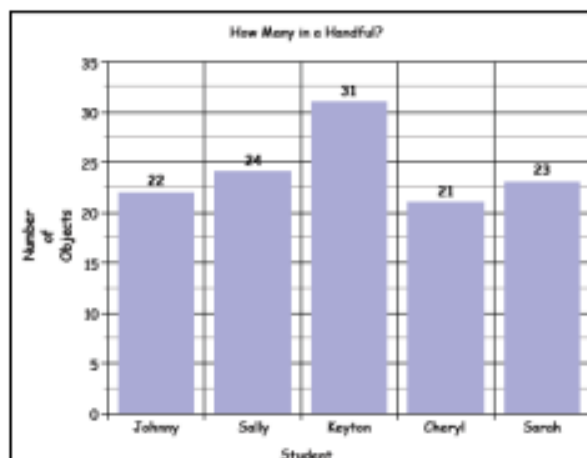
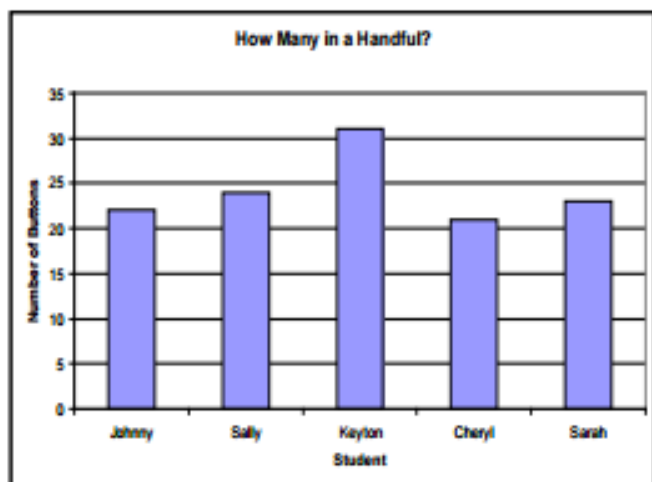
If students have a difficult time determining a reasonable estimate, they can be shown how a group of five or ten of the items looks. Then, students can think about how many groups of five or ten they think they could hold in a handful.

Look at the objects you will be using to find out "How Many in a Handful."

1. Of the students in your group, who do you think can hold the most?
2. Of the students in your class, who do you think can hold the most?
3. Each student in your group should predict how many objects they can hold in one handful. Record the predictions in the table below.
4. Each student in your group should take a handful of objects. Count how many objects can be held in a handful. Record the results in the table above.
5. How close was your estimate to your actual handful? How do you know?
6. Whose estimate in your group was closest to the actual number of objects in a handful?
7. Using the data in the table above, create a bar graph to display the data. Be prepared to share your group data with the class.

Create a Bar Graph - Using the actual handful data collected, each student will create a bar graph to represent the data for their group. Groups should then be given the opportunity to talk about what their graphs show about the handfuls of the group members, and then share this information with the class. The bar graph (below, left) was created using Excel; alternatively, students can use the Create A Graph website (below, right).

<http://nces.ed.gov/nceskids/createagraph/default.aspx?ID=3525a186ca2b4d3e8589a61cbefa47ac>.



Name _____

It's in the Data

recording sheet I



You will be finding measurement data of your classmates. Record the data for each student in your class in the table below.

[illegible]

Name _____

It's in the Data

recording sheet II



You will be finding handful of objects data for different people. Record the data for each student in your group.

[illegible]

3rd Grade Unit 6: Real World Experience

It's in the Data

(student version)

In working with numbers and data, mathematicians have figured out clear concise ways of showing information. Keeping this in mind, you would like to clearly show the size of third graders in your class in an organized fashion so that others can easily view the information.

Task 1: Enjoy the story *Lemonade for Sale* and think about...

- How are tables, bar graphs, and lines plot graphs be useful ways to display data?
- How do I decide what increments to use for my scale?
- How can graphs be used to display data gathered from a survey?
- How can graphs be used to compare related data?

Task 2: Line/Dot Plots showing measurement data

Line plot graphs (sometimes called dot plots) are an excellent way to display data in an easy and quick manner. Line plot graphs are used to record measurement data.

Use the following questions to generate measurement data:

- How tall are your classmates to the nearest $\frac{1}{4}$ inch?
- What is the arm span of your classmates to the nearest $\frac{1}{4}$ inch?
- How long are your classmates' hands from the tip of their finger to their wrist to the nearest $\frac{1}{4}$ inch?

Using the classroom data you collected, create a line plot graph that shows the answers to one of the above questions.

On the back of your line plot, answer this question...

What does the data that you displayed in a line plot tell you?

Name _____

It's in the Data

recording sheet I



You will be finding measurement data of your classmates. Record the data for each student in your class in the table below.

[illegible]

Task 3: Bar Graph showing hand capacity data

1. Look at the objects in the container you will be using to find out “How Many in a Handful?”

Then, think about these questions...

- Of the students in your group, who do you think can hold the most?
- Of the students in your class, who do you think can hold the most?

2. Predict how many objects you can hold in one handful, and record the prediction in the table.

3. Record the predictions of the others in your group too.

4. Each student in your group should take a handful of objects. Count how many objects can be held in a handful. Record the results from everyone in your group in the table.

- How close was your estimate to your actual handful? How do you know?
- Whose estimate in your group was closest to the actual number of objects in a handful?

Using the data in the table, create a bar graph to display your group data. Be prepared to share your group data with the class. (You may make your graph on paper, on Excel, or online)

<http://nces.ed.gov/nceskids/createagraph/default.aspx?ID=3525a186ca2b4d3e8589a61cbefa47ac>.

Name _____

It's in the Data

recording sheet II



You will be finding handful of objects data for different people. Record the data for each student in your group.

[illegible]

Task 4: Show what you know (assessed task)

As mathematicians we need to be able to collect data, calculate with the data, interpret data, and construct a viable argument as to your interpretation of the data. Now that you have collected data and created a picture of the data, it is now time to explain the data. Craft a detailed explanation of what you did with the data and why you did it. Use the questions below to generate thinking.

Thinking about your experience in creating the line plot graph...

- What values need to be included on the number line?
- How do you know?
- Where is the data clumped?
- Where are the gaps in the data?
- What similarities do you see between a line plot and a bar graph?
- How is this line plot different from a bar graph?
- Would you prefer to show this data in a line plot or bar graph? Why?

Thinking about your experience in creating the bar graph...

- What information can you gather from your graphs?
- What decisions can you make from your data?
- How will you label the horizontal and vertical axes? How do you know?
- How will you label the scale on your vertical axis? How do you know?
- How did you choose the increments (1, 5, or 10) used to label the scale on the vertical axis?
- How would the graph be different if different increments were used?
- What does the graph show you about the data?
- What do you notice?
- Would you prefer to show this data in a line plot or bar graph? Why?

Meeting	<p>Line Plot</p> <ul style="list-style-type: none"> • Student includes information about the number line and an explanation • Student evaluates and explains inferences from the line plot • Student compares a line plot and bar graph <p>Bar Graph</p> <ul style="list-style-type: none"> • Student explains axes labels • Student explains information from the bar graph • Student explains how increments affect the graph • Student evaluates and explains inferences from the Bar Graph <p>Student fully explains decision of the appropriate graph for this data set</p>
Developing	Student meets 6 out of 8 criteria
Beginning	Student meets less than 6 criteria
Notes	