Math 1 (CC)

Math 1 (CC)Grade 1|Mathematics|Common Core|2013-2014

Friday, January 31, 2014, 11:59AM

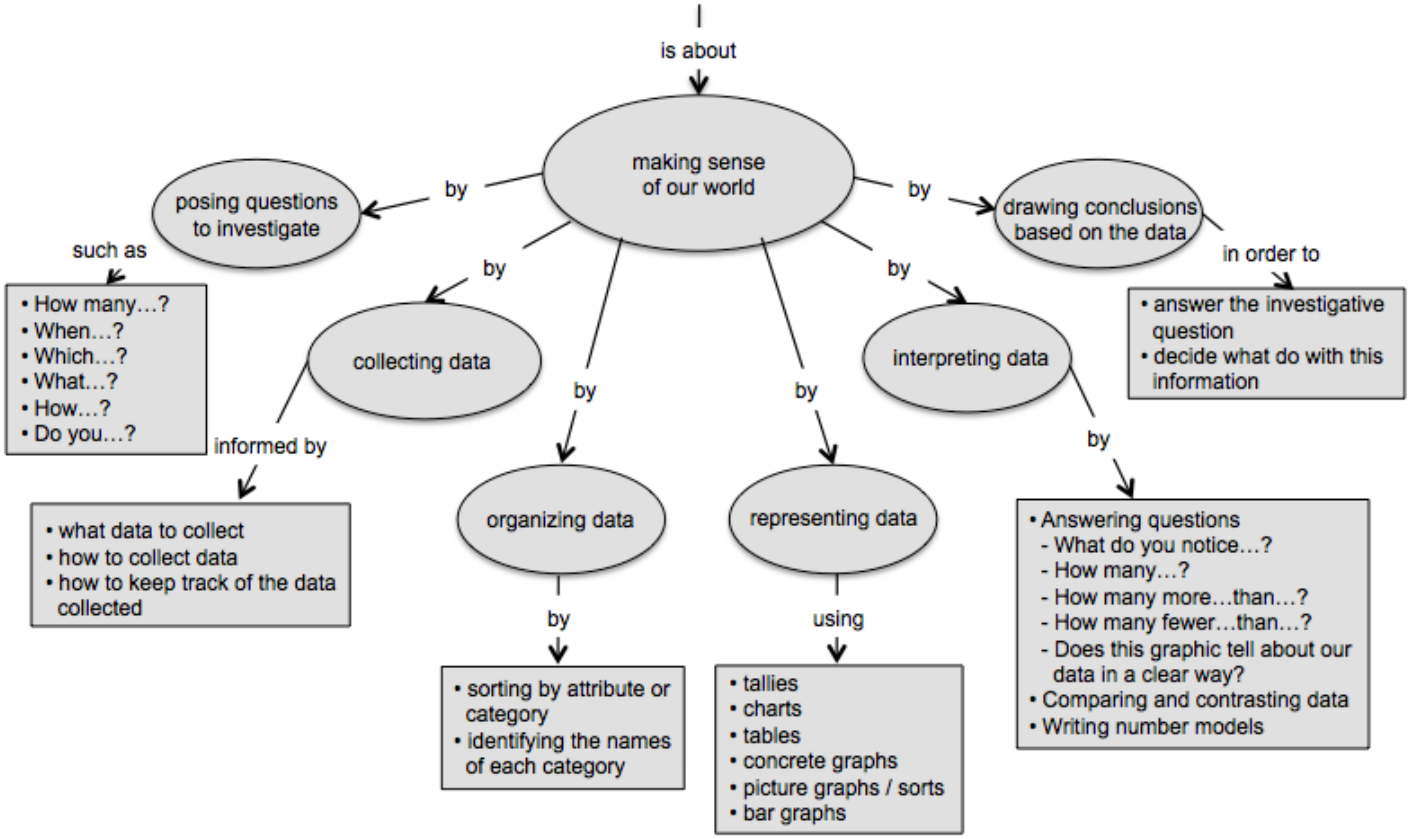
Unit: 4 - Organizing and Representing Data (Week 16, 3 Weeks)

Common Core Initiative

Overarching Questions and Enduring Understandings

How do data displays help us in real life?

Graphic Organizer



Unit Abstract

Experiences with creating patterns and sorting objects by various attributes prepare students for the more complex series of steps involved in graphing data: collecting, organizing, representing, and interpreting data in purposeful ways. In order to decide on the categories that will be represented in a graph, students need to understand that objects and information can be categorized in different ways. When sorting objects, students learn that attribute blocks can be sorted by color, by shape, and by thickness. Buttons can be sorted by color, number of holes, buttons with holes or buttons with shanks. Objects can be sorted by more than one attribute at a time (e.g., red AND triangle). Students need both structured experiences, with the teacher telling students the sorting and classifying scheme to follow, and unstructured experiences when students decide on the sorting rule.

In first grade, data collection typically follows a predictable sequence. Before constructing a question that requires collecting data, students need to be clear about the information they want to obtain. When they are clear about this information, they are ready to construct a question that can be answered by collecting and interpreting the relevant data. The question posed needs to be one of interest to the students. It may relate to information about students in the

classroom or to decisions the students are going to make; it may relate to students' families or to the larger school community. Or the question might be more academic, related to a science or social studies unit or to other interests beyond the school and family communities. For example, "How many times do different balls bounce when they are dropped from the same height?" is a question for students to investigate when they are learning about fair tests that scientists design. Students need to understand how data are useful in everyday life.
After an investigative question has been identified, students need to determine what data to collect to answer this question. For instance, if they want to collect data on how students in their class get to school, they need to decide on the options. If students ride in a bus or in a car or if they walk, this graph will have three categories. If some students ride their bikes, there will be four data categories. Then students will be ready to gather data by surveying everyone in the class. They may begin with three categories, but in the data collection process learn that some students ride a bike to school. Then they will need to add a fourth category to their data display. Students may initially keep track of the data they collect by making tally marks or by grouping markers according to category. They will then be ready to decide how they want to represent the data in an organized way. Some representations used in first grade are picture graphs, marking schemes (e.g., tally charts), and bar graphs. Finally, students are ready to analyze the data and draw conclusions based on the data using the "language of data."

Working with data provides numerous opportunities for working with other mathematics concepts. The context of the problem, including the investigative question, makes this a word problem to solve. Students may add numbers represented in two or more categories. They will need a great deal of practice comparing numbers to determine how many more/less ___ than ___. They will need many experiences connecting the visual representations on graphs to the number sentences that represent the mathematical relationships.
In first grade, students can typically sort a given group of objects independently. However, the problem solving involved in constructing an investigative question and collecting, organizing, representing and interpreting data is a complex interwoven set of steps that will be learned by working as a whole class with a great deal of teacher instruction and guidance. Students initially will make suggestions for the decisions required with each step in the process, guided by questions the teacher ask. For instance, "What investigative question could we pose about the snow day we had last week"? "How can we find the answer to your question"? "How can we organize and represent the data you collect"? "What do these data show us"? "What number model represents what you explained"? If students have collected a large amount of different data, ask, "Could you group the data into four or five different categories"? With many opportunities for guided practice, students will learn to carry out the steps with greater independence.

Unit Overview (Word)

Unit Overview (PDF)

Content Expectations/Standards	Unit Level Standards
Grade 1, Operations & Algebraic Thinking **1.OA.A. Represent and solve problems involving addition and subtraction.** • 1.OA.A.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. **1.OA.C. Add and subtract within 20.** • 1.OA.C.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). **Grade 1, Measurement & Data** **1.MD.C. Represent and interpret data.** • 1.MD.C.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	

Essential/Focus Questions	Key Concepts
Questions to Focus Assessment and Instruction: 1. Where do questions for collecting data come from? 2. How do graphs and charts help us answer questions? 3. How can I collect and organize data I collect? 4. How can I display data I get from a data collection? 5. Why might it be useful to represent the data I collect in another way (e.g., a tally chart)? 6. What questions can I ask and answer about the data displayed in my chart or graph? How might this be represented as an equation? 7. What are the strengths and weaknesses of the different ways of representing data?	question investigate attribute data collect organize sort classify category compare represent interpret less than, least more than most different least same columns rows survey draw conclusions fewer, fewest data representation

Assessment Tasks	Intellectual Processes
Assessment Overview Student Handouts Teacher Response Record	**Standards for Mathematical Practice** ***Students have opportunities to:*** • **make sense of problems and persevere in solving them** when they collect, organize and interpret data to answer an investigative question; • **reason abstractly and quantitatively** when they analyze and interpret data that are represented in a data display; • **construct viable arguments** when they explain their interpretation of the data displayed in a chart or graph and listen to the **reasoning of others**; and • **model with mathematics** when they collect, organize, analyze, and draw conclusions from data that are represented in a chart or graph.

Lesson Sequence	Resources
Lesson Overview Tally Chart Student Graph Icons-Grids Class Graph Icons Professional Learning Task-Student Work Sample Data Transfer Notes - 5.31.13	Unit Resources

« Previous Year

Last Updated: Friday, January 31, 2014, 11:58AM
Atlas Version 8.0.2