



KENAN FELLOWS PROGRAM
FOR TEACHER LEADERSHIP

Advancing Healthcare Analyzing Data and Constructing Bar Graphs

Students will work in groups to compare data and construct picture graphs and bar graphs. Students will be presented with data examples from the Vidant Medical Group's Home Health division. The data will detail examples of their patient enrollment numbers.

Introduction

Vidant Medical strives to deliver quality healthcare to the residents of eastern North Carolina. The goal of Vidant Home Health is to reduce the remittance of patients recently released from the hospital. Often times throughout the year my students and I discuss careers. When we discuss careers within healthcare, the first things that come to mind are doctors and nurses. Students rarely mention radiologist, engineers, emergency medical technicians, or nutritionist. Throughout the following lessons students will interact with examples of data that represent the number of patients referred to the agency in 2017.

Curriculum Alignment

CCSS.3.MD.B.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.

Objectives

Students will be able to:

- Construct a pictograph and bar graph
- Compare data using the graphs they created
- Solve world problems using information from the graph

Time & Location

12:10pm-1:05pm West Greene Elementary School

This lesson will require two math lesson periods of 60 minutes. Some classes may be able to complete the lessons in 2 days. Others classes may require 3 days.

Teacher Materials

Materials and resources needed:

- Promethean Board
- Paper and digital copy of data

Student Materials

Materials and resources needed:

- Chart paper
- Pencils
- Markers
- Rulers
- Interactive Notebook
- Data

Safety

This lesson has no potential safety hazards.

Student Prior Knowledge

Students will need to know how to do the following in order to be successful:

- Analyze and recognize trends in data
- Add and subtract numbers
- Compare and order numbers
- Work together in collaborative groups as a team

Teacher Preparations

Teacher will need to have made students accustomed to working together in groups. They will need paper and a digital copy of the data that should be review before the actual lesson.

Activities

Step 1: Teacher will review steps to reading graphs. Teacher will start with picture graphs, and then proceed to reviewing how to read bar graphs. Teacher will then click the link below for the video that shows students how to create bar graphs.

How to make a simple bar graph <https://youtu.be/HHHjQFjtnCs>

Next teacher will explain today's objectives:

- Construct a pictograph and bar graph
- Solve world problems using information from the graph

Step 2:

Teacher will present students with the data samples. Students need to be given time to look over the data independently. Give them 3 minutes. Next teacher will display the data on the promethean board. Teacher will encourage the students to compare the data and to notice differences and similarities (independently). Next, teacher will review the steps to setting up the graph.

Step 3:

1. Have the students their horizontal line (axis) and then the vertical line (axis).
2. Ask students to write the name of the location below the horizontal axis. Remind students to pay close attention to spacing. The graph must be easily read.
3. Students need to discuss what numbers will go on the vertical axis. For instance if Location A had 20 new enrollees and Location B had 60, would they be number 1-20, or 10-100?

Step 4:

Teacher will have student groups complete the picture graph first on large chart paper. Students will have an easier time creating their bar graph if the picture graph is created first.

As a class, decide what might be some great pictures to represent the data.

Remember, a major goal is to increase our students' knowledge about health careers, so let's steer them towards pictures that go along with our theme. (They may come up with drawings of a hospital, doctor, patients, etc.)

Step 5:

Once students have finished the pictograph, they will have an easier time completing the bar graph. The vertical and horizontal axis are complete and students know how far up each category should go. Now the group needs to draw bars for each category.

Location	Rating	New Enrollments
Location A	★★★★★	76
Location B	★★	235
Location C	★★★★★	83
Location D	★★★	134

Step 6:

Teacher will circulate the room while observing students as they work in groups. Be sure to listen for “math talk” (i.e. use of math vocabulary, conversation that is on topic and relevant). Guide students as they construct their graphs, praising proper use of vocabulary and how well they are working together as a team.

Day 2

Teacher will guide students to complete (This may be the last day. Some groups will work faster than others, however some may need a third day.) If all graphs are completed, move on to the assessment questions. For groups that finish early, there is an activity sheet directing students to use data from a table to create a bar graph.

Assessment

Teacher will allow students to work in groups to answer 8 questions. Circulate the room to make sure that all students are contributing and assisting their teammates with solving the problems. Please use the rubric below to measure student proficiency.

Met/Not Met (Please Check)	To be considered proficient, 4 out of 5 of the following tasks must be accomplished.
	Group accurately constructed and labeled graphs.
	Group discussions were relevant and math vocabulary was utilized.
	Group answered all data word problems.
	Group followed all directions given.
	Groups worked collaboratively and all members contributed to the math product.

Critical Vocabulary

- Data- a collection of facts, such as numbers, words, measurements, observations or even just descriptions of things.
- Picture graph-a way of showing data using pictures
- Title-describes the information that can be found in the graph
- Symbols- a thing that stands for something else
- Key-the place in a pictograph that gives information about the symbols
- Bar Graph- a graph drawn using rectangular bars to show how large each value is.
- Scale - which shows the units used on the bar graph.

Author Information

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Name _____

Teacher _____

Location	Rating	New Enrollments
Location A	★★★★★	76
Location B	★★	235
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Location D	★★★	134

1. How many more people were enrolled into Location D than in Location A?
2. Did more people enroll in Location D or Location C?
3. Which location received the most enrollments?
4. What is the combined number of enrollments for Location B, Location A and Location D?
5. What location received the least enrollments?
6. How many patients were enrolled in either Location B or Location D?
7. How many enrollees were there in all?
8. What two locations received the least amount of enrollees?
9. What do you notice about the locations that received the most amount of satisfaction stars? What might be some reasons people were so satisfied?
10. What do you notice about the locations that received the least amount of satisfaction stars? What might be some people were unsatisfied?

Analyzing Data/Constructing bar graphs and Pictographs

Name _____

Teacher _____

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Location A	★★★★★	76
Location B	★★	235
Location C	★★★★★	83
Location D	★★★	134

1. How many more people were enrolled into Location D than in Location A? **58**
2. Did more people enroll in Location D or Location C? **51**
3. Which location received the most enrollments? **Location C**
4. What is the combined number of enrollments for Location B, Location A and Location D? **445**
5. What location received the least enrollments? **Location B**
6. How many patients were enrolled in either Location B or Location D? **369**
7. How many enrollees were there in all? **528**
8. What two locations received the least amount of enrollees? **Location A and Location C**
9. What do you notice about the locations that received the most amount of satisfaction stars? **Those locations have the lowest enrollment numbers.** What might be some reasons people were so satisfied? **The nurses and physical therapists were able to provide better service due to low numbers.**
10. What do you notice about the locations that received the least amount of satisfaction stars? **Those locations have the highest enrollment numbers.** What might be some reasons people were not as satisfied? The high numbers meant more patients to see. **The nurses and physical therapists were busier.**

Name: _____

Bar Graph

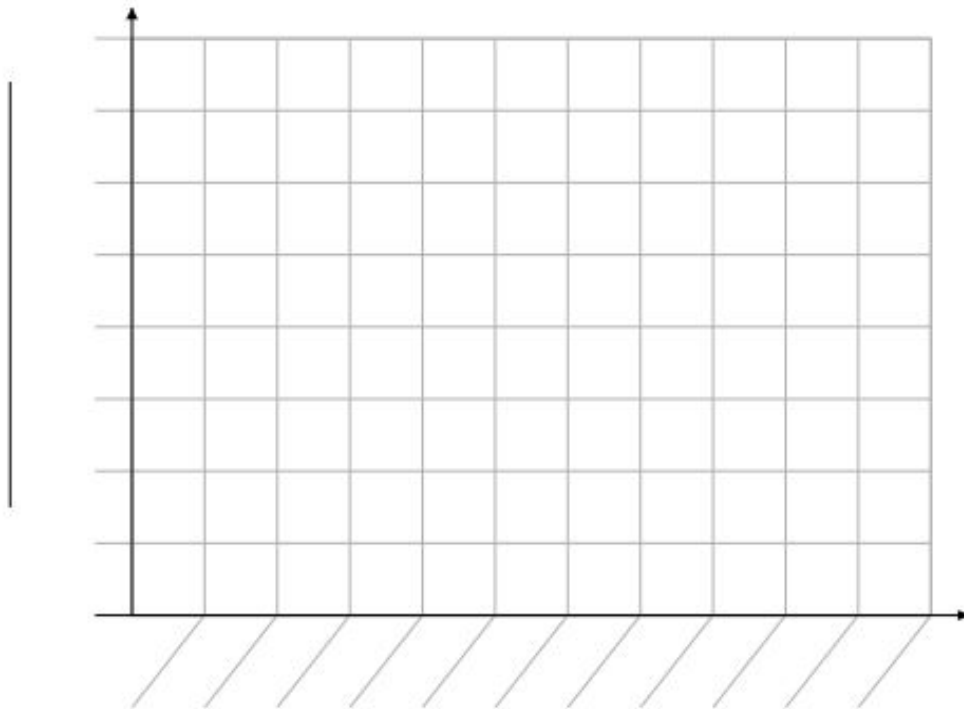
The table below show the type and number of animals on Farmer Ted's farm.

Chickens	Cows	Pigs	Sheep	Dogs
30	10	15	20	5

Use the table data to complete the bar graph to show the type and number of animals on Farmer Ted's farm.

Remember to:

- title your graph
- label both axes
- provide a scale
- graph the data



ANSWER KEY

Bar Graph

The table below show the type and number of animals on Farmer Ted's farm.

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Farmer Ted's Animals

