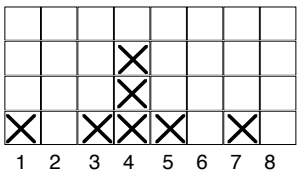
Grade 4, Unit Eight: Wingspans: Measurement & Data Analysis

This unit is special because it combines math and science. Students learn about birds' bodies (their wingspans, how much they weigh, etc.) and do their own experiments with paper airplanes to gather data. While studying birds and the science of flight, students learn more about measurement and data analysis. In this unit, your child will:

- make and interpret different kinds of graphs, including scatter plots and line plots
- identify the mean, median, mode, maximum, minimum, and range in a data set
- convert between inches and feet, and between ounces and pounds

Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

Problem	Comments
Lola is studying the blue jays that live near her school. She watched carefully to see how many eggs each of the seven mother blue jays laid (the group of eggs is called a *clutch*). She showed the information on this line plot. **Number of Eggs in Each Clutch**  1 2 3 4 5 6 7 8	Students practice finding measures of variability (like the range) and measures of center or averages, including the mode, median, and mean. These numbers provide a lot of information about a set of data, especially when paired with a graph like the line plot in this example. The definitions below will help refresh your memory about these statistics.
Use the line plot above to find the: minimum **1 egg** maximum **7 eggs** range **7 − 1 = 6 eggs** mode **4 eggs** median **4 eggs** **1 3 4 4 4 5 7** mean **4 eggs** **1 + 3 + 4 + 4 + 4 + 5 + 7 = 28** **28 ÷ 7 = 4**	**minimum** the lowest value in the data set **maximum** the highest value in the data set **range** the difference between the highest and lowest values in the data set **mode** the value or values that appear most often in the data set **median** the middle value in the data set, when all the values are put in numerical order **mean** the mathematical average (Add all the values and divide the sum by the number of values to find the mean.)

Look at the line plot above. What does it show about blue jay clutches? Imagine you are telling someone who can't see this line plot. **The 7 blue jays laid anywhere from 1 egg to 7 eggs. Most laid somewhere between 3 and 5 eggs. The most common number of eggs in a clutch was 4 eggs.**	The description in this example is straightforward, but explaining with clarity what a set of data shows is quite sophisticated. To write a clear description, students must be able to read the graph, consider the statistics in the context of the situation, and then describe the whole picture clearly with words. Students will continue to hone this set of skills through high school and into college.
Fill in the missing numbers on the table. **inches** | 12 | 24 | **36** | **48** | **60** **feet** | 1 | **2** | 3 | 4 | 5 Susie cut a piece of wood that was 7 ½ feet long. How many inches long was the piece of wood? Show all your work. **7 feet x 12 inches per foot = 84 inches** **½ foot x 12 inches per foot = 6 inches** **84 inches + 6 inches = 90 inches**	Because there are12 inches in 1 foot, students multiply by 12 to convert from feet to inches. To convert from inches to feet, they divide by 12. When students have a good understanding of the relationships between these units, they can convert a measurement from one unit to the other in context.
Fill in the missing numbers on the table. **ounces** | 8 | 16 | **24** | 32 | **40** **pounds** | 1 | **2** | 3 | **4** | 5 Mr. Johnson bought 16 ounces of white flour and 32 ounces of whole-wheat flour. How many pounds of flour did he buy altogether? Show all your work. **16 ounces = 2 lbs. 32 ounces = 4 lbs.** **2 lbs. + 4 lbs. = 6 lbs.**	Because there are 8 ounces in 1 pound, students multiply by 8 to convert from pounds to ounces. To convert from ounces to pounds, they divide by 8. When students have a good understanding of the relationships between these units, they can convert a measurement from one unit to the other in context. In this example, the student first converted the amounts to pounds and then added them. You could also add the two amounts and then divide by 8 to find the number of pounds.

Frequently Asked Questions about Unit Eight

Q: Is it distracting to do math and science at the same time?
A: Math and science are closely related. Scientists use mathematics to make sense of data they collect through studies and experiments. In this unit, students first use mathematics to analyze and interpret information about birds. Then they use those same skills to analyze and interpret data they collect from their own experiments about flight. By integrating math and science in a purposeful way, this unit helps students see that mathematics is not a collection of disconnected skills and topics, but a way of thinking and a set of tools they can use to make sense of the world around them.