CHAPTER 11

Family Letter

Section A

What We Are Learning

Collecting, Describing, and Displaying Data

Vocabulary

These are the math words we are learning:

back-to-back stem-and-leaf plot a means to compare two sets of data

box-and-whisker plot a way to show the distribution of the data through the use of quartiles and the median

line of best fit a straight line that comes closest to the points on a scatter plot

line plot a data display that uses a number line to show how often an value occurs

mean the sum of the values, divided by the total number of values

median if an odd number of values, the middle value; if an even number of values, the average of the two middle values

mode the value or values in a data set that occur most often

negative correlation a relationship in a scatter plot where the values of one set of data decrease while the values of the other set of data increase

no correlation two data sets in a scatter plot have no correlation when there is no relationship between the data values

Dear Family,

The student will learn to organize data so it can be evaluated. A **stem-and-leaf plot** is one method used to organize large amounts of data in a simple, yet precise, manner.

Create a stem-and-leaf plot of the data values.
85, 74, 91, 77, 86, 80, 71, 79, 82, 84, 99, 62

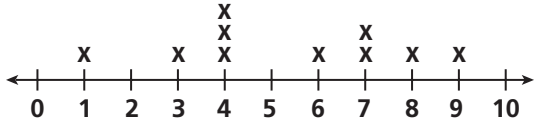
Step 1 Find the least data value and the greatest data value. Since the data values range from 62 to 99, use the tens digits for the **stems** and the ones digits for the **leaves.**

Step 2 List the stems from least to greatest on the plot.

Step 3 List the leaves for each stem from least to greatest. For the number 62, the 6 is the stem and the 2 is the leaf.

Stem	Leaves
6	2
7	1 4 7 9
8	0 2 4 5 6
9	1 9

The student will also learn how to create and read **line plots.** To create a line plot, the student will start with a number line, and then will use x's to indicate how often values occur in a data set. For example, the data set 9, 8, 4, 1, 4, 3, 4, 7, 7, 6 would be represented by the line plot below.



outlier an extreme value that may have an effect on the mean of the data

positive correlation a relationship in a scatter plot where the values of both sets of data increase at the same time

range the largest data value minus the smallest data value in a set of data

stem-and-leaf plot a graph used to organize and display data so that the frequencies can be compared

Once the data is organized, the student will use the following measures to describe the data.

Mean	The sum of the values divided by the number of values, otherwise known as the average.
Median	The median is the middle value if there is an odd number of values. If there is an even number of values, the median is the average of the two middle numbers.
Mode	The value or values that occur most often in a set of data. If no value occurs more than once, then there is no mode.
Range	The largest data value minus the smallest data value in a set of data.

The student will also learn to identify an outlier. An outlier is an extreme piece of data. Ask the student to explain how each of the measures of central tendency are affected when you remove an outlier.

The student will also learn about data displays that show relationships between the values within a data set, or between two different data sets. A **box-and-whisker plot** is a graphic display of the spread of the values in a data set and how they are grouped.

A **scatter plot** shows how two different data sets are related. The data sets can have a **positive correlation,** a **negative correlation,** or **no correlation.** Ask the student to draw scatter plots that show each of these kinds of correlation.

Encourage the student to be aware of the everyday instances of data analysis and the importance it has in our lives.

Sincerely,

CHAPTER 11

Family Letter

Section B

What We Are Learning

Probability

Vocabulary

These are the math words we are learning:

compound event an event made up of two or more simple events

dependent events events for which the outcome of one event affects the probability of the other

disjoint events events that cannot occur in the same trial or experiment

event a set of one or more outcomes of an experiment

experiment an activity based on chance

experimental probability the ratio of the number of times an event occurs to the total number of trials

independent events events for which the outcome of one event does not affect the probability of the other

outcome a possible result of an experiment

probability a number from 0 to 1 that tells how likely an event is to happen

sample space the set of all possible outcomes of an experiment

Dear Family,

In this section, the student will be learning the necessary terminology for understanding and applying the concepts of **probability.**

Here is how the student will learn how to find the probabilities of **outcomes** in a **sample space.**

A number cube has a digit from 1 to 6 written on each of the faces. So, the sample space is {1, 2, 3, 4, 5, 6}.

A. What is the probability of rolling a 4?
There is only one 4 and there are a total of 6 digits in the sample space.

$P(\text{rolling a 4}) = \frac{1}{6}$.

B. What is the probability of not rolling a 4?
The probabilities must add up to 1.

$P(\text{not rolling a 4}) = 1 - P(\text{rolling a 4}) = 1 - \frac{1}{6} = \frac{5}{6}$.

The student will also learn how to find probabilities of **events** by adding the probabilities of all the outcomes included in the event.

A bank teller's cash drawer contains 4 types of bills; $1, $5, $10, and $20. The table gives the probability of randomly selecting each type of bill from the drawer. What is the probability of selecting a $1 or a $5?

$P(\$1 \text{ or } \$5) = P(\$1) + P(\$5) = 0.36 + 0.30 = 0.66$

Bill	$1	$5	$10	$20
Probability	0.36	0.30	0.24	0.10

The student will also be introduced to **experimental probability.**

A large aquarium contains goldfish, black fish, and red fish. Julie recently has seen 5 goldfish, 7 black fish, and 3 red fish. What is the probability that the next fish she sees will be a goldfish?

Outcomes	Gold	Black	Red
Observations	5	7	3

$$\frac{\text{number of goldfish}}{\text{total number of fish}} = \frac{5}{5 + 7 + 3} = \frac{5}{15} = \frac{1}{3}$$

The probability that Julie sees a goldfish next is $\frac{1}{3}$ or 33%.

theoretical probability the ratio of the number of equally likely outcomes in an event to the total number of possible outcomes

trial the act of trying, testing, or putting to the proof

The student will learn how to apply the concepts of probability. This is how your child will apply the concepts of **theoretical probability.**

An experiment consists of rolling a number cube and flipping a coin. There are 12 possible outcomes: H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, and T6. What is the probability of getting a heads and rolling an odd number?

There are 3 outcomes in the event of getting a heads and rolling an odd number: H1, H3, and H5.

$P(\text{heads and odd}) = \frac{3}{12} = \frac{1}{4}$.

To find the probability that two **independent events** occur, the student will multiply the probability that the first event happens by the probability that the second event happens.

To find the probability that two **dependent events** occur, the student will multiply the probability that the first event happens by the probability that the second event happens. The student must keep in mind that the first event will affect the probability of the second event.

Joey is now holding one hat containing 26 pieces of paper on which each letter of the alphabet is written. If you choose 2 letters from the hat, what is the probability that both are vowels?

$P(\text{vowel from } 1^{st} \text{ choice}) = \frac{5 \text{ vowels}}{26 \text{ letters}}$

$P(\text{vowel from } 2^{nd} \text{ choice}) = \frac{4 \text{ vowels left}}{25 \text{ letters left}}$

$P(\text{vowel and vowel}) = \frac{5}{26} \cdot \frac{4}{25} = \frac{2}{65}$

Try to relate everyday probability situations to the student to help reinforce the ideas and concepts in this lesson.

Sincerely,