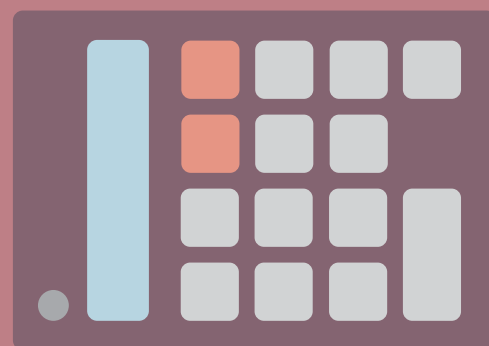




MATH

Student Book



► **4th Grade | Unit 10**

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MATH 410

ESTIMATION, CHARTS, AND GRAPHS

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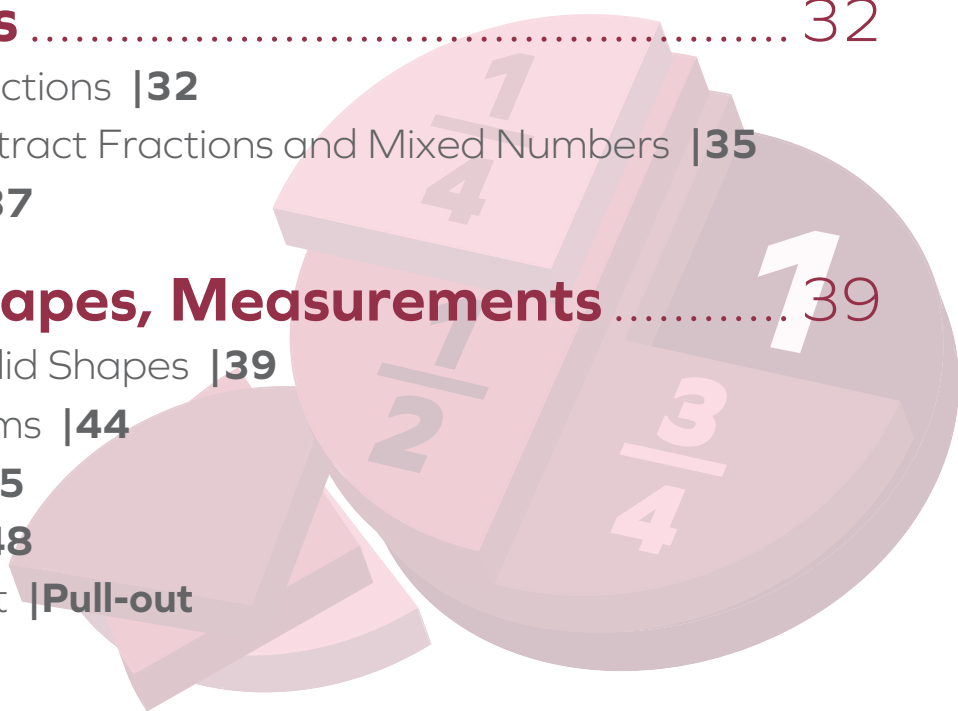
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LIFEPAC Test | **Pull-out**



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1. COLLECTING AND POSTING DATA

Objectives

Read these objectives. When you have completed this section, you should be able to:

- Estimate and predict data.
- Take a random sample.
- Collect data and post data to a chart.

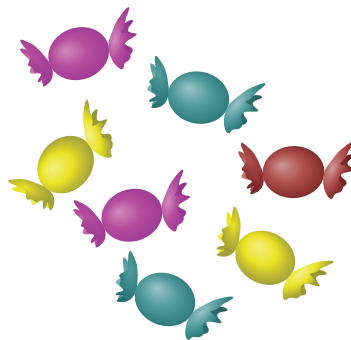
You will need:

4 small paper bags and a large glass jar or dish filled with multi-colored or assorted objects. The objects should be small and there should be a large number of them. The assortment should contain four different colors or types of objects.

Suggested objects:



beads



candies



money

(pennies, nickels, dimes, quarters)

Suggested container:



glass jar

Estimation and Prediction

You have been practicing estimation with numbers. This LIFEPAK will teach you estimation with objects. You will estimate your problem and then collect data about it. Finally, you will place the information on a chart.

Estimation is an opinion of the amount, value, or worth of something.

Data is a list of facts from which a conclusion may be drawn.

A **chart** is an arrangement of data in a logical order.

In Problem 1.1 you will discover how closely you can:

- (1) estimate the number of objects in each of four given groups, and
- (2) estimate the average number of objects in four groups.

Your teacher will place a group of objects in each of four bags. The bags will be labeled Group 1, Group 2, Group 3, and Group 4. Each bag will contain a different number of objects. It may be an assortment of colors. You may hold the bag in any way, but do not look inside.





Complete these activities.

1.1

Estimate the objects.

- How many objects do you estimate are in the Group 1 bag? _____
- How many objects do you estimate are in the Group 2 bag? _____
- How many objects do you estimate are in the Group 3 bag? _____
- How many objects do you estimate are in the Group 4 bag? _____
- What do you estimate is the average number of objects in the four bags? _____

Review: To find the average, we total the numbers and then divide by the number of groups.

1.2

Collect the data. Count the objects in each bag.

- How many objects do you count in the Group 1 bag? _____
- How many objects do you count in the Group 2 bag? _____
- How many objects do you count in the Group 3 bag? _____
- How many objects do you count in the Group 4 bag? _____
- What is the average number of objects in the four bags? _____

1.3

Compare the estimation to the data. What is the difference between ...

- your estimation and your count of the Group 1 bag? _____
- your estimation and your count of the Group 2 bag? _____
- your estimation and your count of the Group 3 bag? _____
- your estimation and your count of the Group 4 bag? _____
- your estimation of the average and the actual average? _____

1.4 Chart the data. Enter the information that you have gathered on the chart.

OBJECTS IN GIVEN GROUPS					
	GROUP 1	GROUP 2	GROUP 3	GROUP 4	AVERAGE
ESTIMATION					
DATA					
DIFFERENCE					

1.5 Review Activities 1.1 – 1.4. Answer the questions.

- a. Have you compared your estimation to the actual count in each group?

- b. Have you compared your estimation to the actual average in each group?

- c. What is the difference between your estimation and the actual count in Group 2?

- d. What is the actual average number of objects from the four groups?

- e. What is the difference between your estimated average and the actual average?

When you are finished, put all of the objects back into the large glass container.

Predicting is to tell something in advance.

A **random sample** is a sample in which every member of a large group has an equal chance of being chosen.

This next activity will help you to determine by random sampling the distribution of colored objects in a large quantity.

You will need a random sample.

The colors selected for this activity are red, yellow, green, and purple.

NOTE: If your group of objects does not contain these colors, simply assign one of the colors (red, yellow, green, or purple) to each of the colors or different objects that you have. Be certain the objects are well mixed in the container, and then, without looking, remove a group of objects from the container. This is called a *random sample*. It should be large enough to represent the objects in the container. Ask your teacher to count and tell you the total number of objects in the random sample.



Complete these activities.

1.6 Predict the objects in the random sample *without looking* at the sample.

- a. How many “red” objects do you predict are in the random sample? _____
- b. How many “yellow” objects do you predict are in the random sample? _____
- c. How many “green” objects do you predict are in the random sample? _____
- d. How many “purple” objects do you predict are in the random sample? _____

- 1.7

Collect the data. Divide the random sample into four piles by color. Count the number in each pile.

a.

How many "red" objects did you count?

b.

How many "yellow" objects did you count?

c.

How many "green" objects did you count?

d.

How many "purple" objects did you count?

- 1.8

Compare the prediction to the random sample. What is the difference between your prediction and ...

a.

your count of the "red" random sample?

b.

your count of the "yellow" random sample?

c.

your count of the "green" random sample?

d.

your count of the "purple" random sample?

e.

Return the objects to the glass container. How many objects do you predict are in the glass container?

- 1.9

Compare the random sample to the actual count. Remove all of the objects from the container and divide them into piles by color.

a.

How many "red" objects were there in the container?

b.

How many "yellow" objects were there in the container?

c.

How many "green" objects were there in the container?

d.

How many "purple" objects were there in the container?

e.

How many total objects were there in the container?

- 1.10** Chart the data. Enter the information you have gathered on the chart.

DISTRIBUTION OF COLORS					
	RED	YELLOW	GREEN	PURPLE	TOTAL
PREDICTION OF RANDOM SAMPLE					
DATA FROM RANDOM SAMPLE					
DIFFERENCE					
COUNT OF OBJECTS FROM CONTAINER					

- 1.11** Review Activities 1.6 – 1.10. Answer the questions.

- a. Arrange the colors in order from largest to smallest ...
- from your prediction. _____
- from the random sample. _____
- from the actual count. _____
- b. Was your prediction or the random sample closer to the actual count? _____
- c. Write a sentence telling whether you think a random sample is a good way to find out information about a large quantity.
- _____
- _____
- _____
- _____

Save the data from Section 1 to use in Section 2.



Review the material in this section to prepare for the Self Test. The Self Test will check your understanding of this section. Any items you miss on this test will show you what areas you will need to restudy in order to prepare for the unit test.

SELF TEST 1

Fill in the blanks (each answer, 1 point).

1.01 Match the terms with their definitions.

- | | |
|------------------------|--|
| a. _____ estimation | 1. an arrangement of data in logical order |
| b. _____ average | 2. to tell something in advance |
| c. _____ random sample | 3. a list of facts from which a conclusion can be drawn |
| d. _____ predict | 4. an opinion of the amount, value, or worth of something |
| e. _____ chart | 5. dividing the total number by the number being counted |
| f. _____ data | 6. every member of a large group has an equal chance of being chosen |

Complete these activities (each lettered question, 1 point).

1.02 Answer the questions about *estimation*.

- What objects did you use for your groups? _____
- What type of container did you use? _____
- How many groups did you use? _____
- Did you make your estimations by the *weight* of the bags or by the *shape* of the bags? _____
- How did you find the average? _____

- Was your estimation close to the actual count for any of the groups? _____
Which one(s)? _____
- Why is estimation important? What does it do for us? _____

1.03 Review Activities 1.6 - 1.11 of this LIFEPAK to answer the questions about *predicting* and *random sampling*.

- a. What objects did you use for your groups? _____
- b. Did you use colors or different kinds of objects? _____
What were they? _____
- c. How many objects did you predict for ...
Group 1? _____ Group 2? _____ Group 3? _____ Group 4? _____
- d. How many objects were there in your random sample for ...
Group 1? _____ Group 2? _____ Group 3? _____ Group 4? _____
- e. How many objects were there in your actual count for ...
Group 1? _____ Group 2? _____ Group 3? _____ Group 4? _____
- f. Was your prediction or the random sample closer to the actual count for the groups? _____
- g. Why is a random sample important? What does it do for us? _____

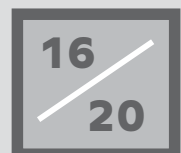


Teacher check:

Score _____

Initials _____

Date _____





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