Important Concepts . . .

Preview Review

Mathematics Grade 4 *TEACHER KEY*

W1 - Lesson 5: Data Management

V5-07

Important Concepts of Grade 4 Mathematics

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W1 - Lesson 2 ..... Addition and Subtraction
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Materials Required

Mathematics Grade 4
Version 5
Preview/Review W1 - Lesson 5 TEACHER KEY

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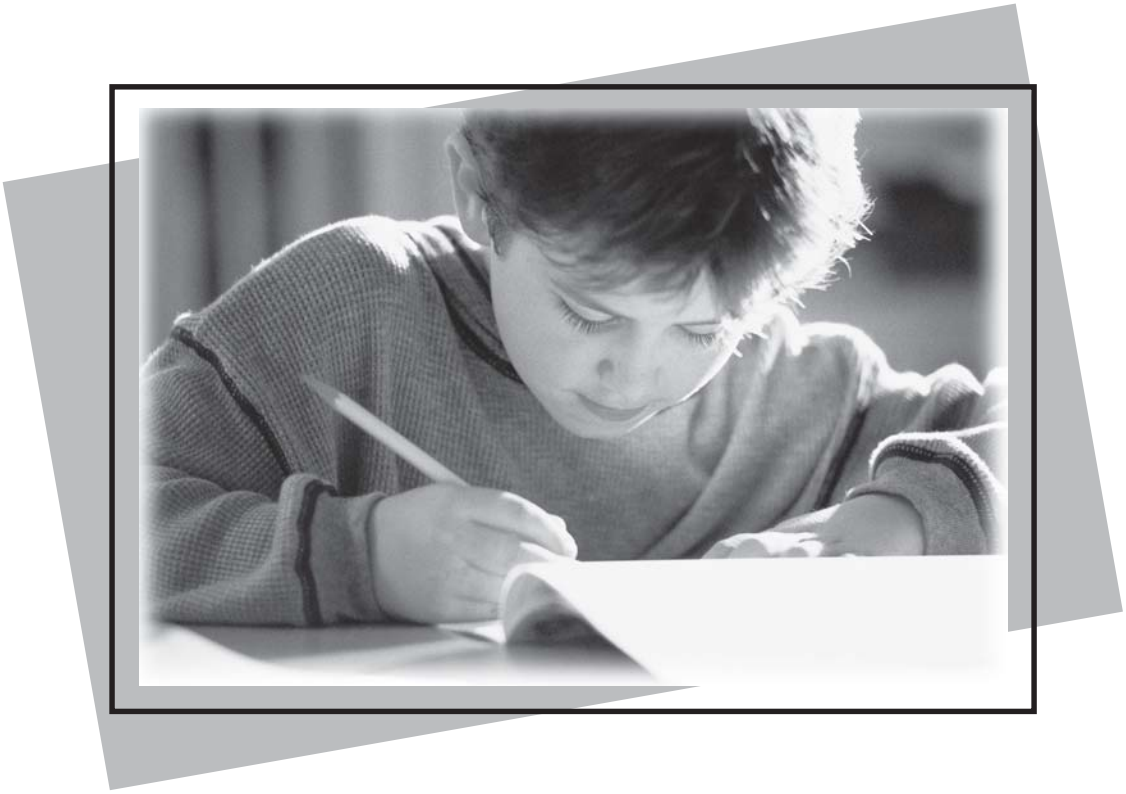
Preview/Review Concepts for Grade Four Mathematics

TEACHER KEY



W1 - Lesson 5: Data Management

OBJECTIVES

By the end of this lesson, you should

- understand that data management is the process of collecting, organizing, and displaying data
- show how a tally sheet is used to record and organize data
- interpret information presented in a pictograph
- interpret information presented in a bar graph

GLOSSARY

bar graph - a graph that presents information by using vertical or horizontal bars

data - facts or information

data management - the collecting, organizing, and interpreting of data

pictograph - a graph that presents information using pictures or symbols

sample - a small group used to provide information about a larger group (In a **random sample**, all members of the population have an equal chance of being chosen.)

survey - one or more questions asked of a sample of people to obtain information

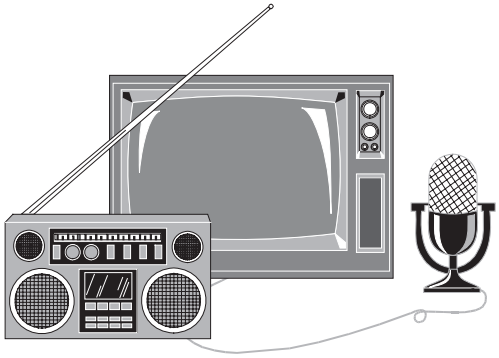
T-table - a table of data that has two columns

W1 - Lesson 5: Data Management

A. Introduction

Data is any information that people collect and use in some way.

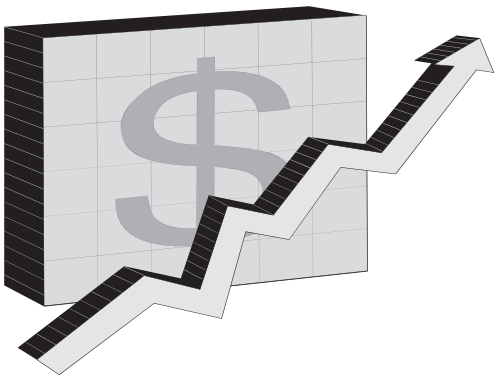
Data may come from many sources:



- TV or the radio
- your teachers
- people you talk to
- calculators, computers, and weigh scales
- books, newspapers, pictures, and maps
- signs and notices
- the Internet

You can also collect your own data by recording information or asking people for information.

Data gives you information that can help you



- learn about new things
- make decisions and choices
- make predictions
- solve problems and find answers

To be useful, the data gathered from these sources has to be **organized**. The data can be organized in many ways. It can be arranged in lists. It can be displayed in different ways using graphs, pictures, maps, or charts.

The way that data is collected, organized, and displayed is called **data management**.

Think of where you have obtained some information since this morning. List as many sources as you can remember:

a. ***Answers will vary.*** b. _____

c. ***Some examples are*** d. _____

e. ***TV, radio, clock,*** f. _____

g. ***newspaper, thermometer*** h. _____

B. Collecting and Recording Data

One way to collect data is to use a tally sheet. On a tally sheet, we use tick marks or check marks to record the data or information.

Suppose you wanted to find the favorite sport of all the students in your class. To keep track of the data, you could use a tally sheet.

If you asked 19 students in your class, your tally sheet might look like this.

Favourite Sport	Tally	Frequency
Hockey	𝍸 |	6
Baseball	𝍸 ||	7
Volleyball	||||	4
Running	||	2

Your Turn!

1. Write the number of tally marks shown in each question.

   a. 𝍸 \|\|\| ___*8*___

   b. 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 \|\| ___*32*___

   c. 𝍸 𝍸 𝍸 𝍸 \|\|\| ___*23*___

2. Use tally marks to show each number below.

   a. 16 𝍸 𝍸 𝍸 \|

   b. 27 𝍸 𝍸 𝍸 𝍸 𝍸 \|\|

   c. 31 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 \|

   d. 9 𝍸 \|\|\|\|

C. Conducting a Survey

A **survey** is one or more questions asked of a group of people to find information.

People conduct surveys for many reasons.

- They may need data or information to help them solve a problem.
- They may want to make decisions or plans for the future.
- They may simply want to collect information that can be used by other people.

Before conducting a survey, you need to make some decisions.

- What do you want to know?
- What question will give you the information that you need?
- What is the best way to ask that question?

Suppose you are planning to set up a concession stand at your local fair. You will sell only hamburgers, hot dogs, and pizza slices. The problem is that you don't really know what most people will order. It's possible you might not have enough of each kind of food. You decide to do a survey to find out what most people prefer.

The kind of question you ask in your survey is important. Some questions may result in people giving answers that are not useful to you.

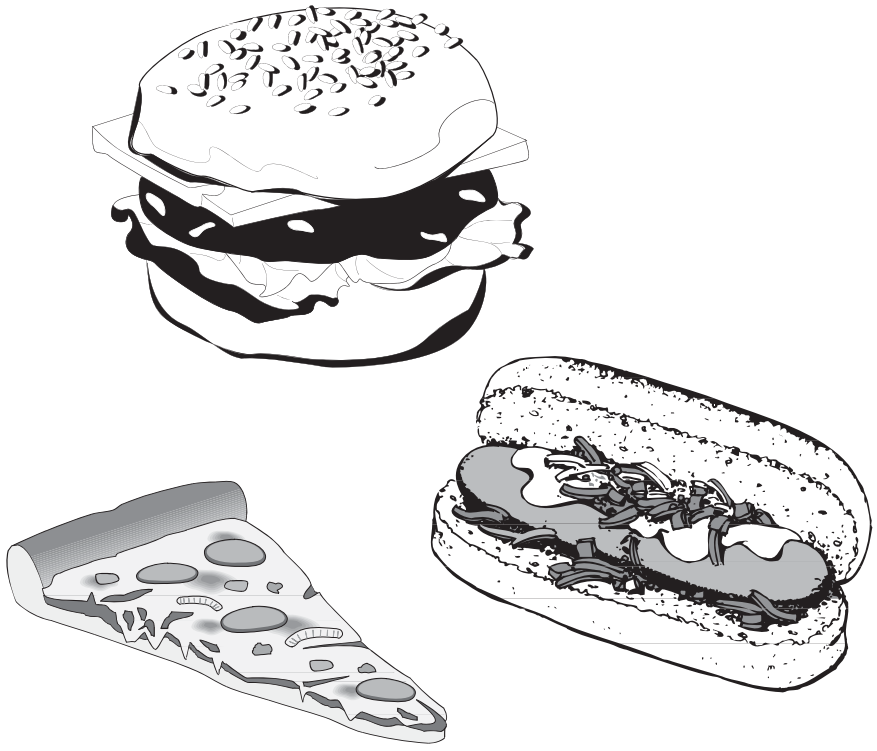
If you ask "*Do you like to eat at the fair*?" people may answer Yes or No. Will that help you with your problem?

If you ask "*What do you like to eat at the fair*?" you might get dozens of different answers, ranging from spaghetti to French fries to cotton candy.

Because you have already decided which three food items you will sell, you need a question that will inform you about which of the three food items is going to be the most popular.

1. What is the question that you might ask to get the best data?

   Answers will vary. A good question might be: What do you like to eat at the fair — hamburgers, hotdogs, or pizzas?



Next, you need to decide whom to survey. You cannot survey everyone who might be coming to the fair. Instead, you will survey only a group of people.

Survey companies often want to find out how popular certain TV shows are. It would be impossible for them to survey every person who watches TV. They will survey only a few hundred (or a few thousand) people to try and find which TV shows are watched the most.

The group of people that they choose to survey is called a **random sample**. A random sample is a small group of people that represents a much larger group. The people are selected **randomly**, meaning by chance or luck. You could use the phone book and pick every tenth name, or stand on a street corner and ask every fifth person.

If you decided to sample only boys in Grade Four, you would not have a good random sample. You would not have any responses from students in other grades, from any girls, or from any adults.

The results would be better if you decided to survey a few students from each grade. Also, you should have men, women, boys, and girls in your random sample. When conducting a survey, deciding on who to survey is as important as what question you ask. All different kinds of people should be included in your random sample.

2. What kinds of people would you ask when obtaining your data? Explain why you would choose these kinds of people.

You should ask both boys and girls and be sure you ask students from each grade in the school. This is necessary to get a sample that is representative of the school population.

You have decided **what to ask** in your survey. You have also decided **whom to ask**. You are now ready to **do** your survey.

3. Find out from at least 10 different people which food item (from a choice of three) they prefer to eat at the fair. Survey yourself as well! Use tally marks to record the information in the space below. Count the tally marks and write the totals in the Frequency column.

Answers will vary. Ensure that the student has used tally marks to record the responses and that he or she has totalled the number of responses for each food item in the Frequency column.

Favourite Food Item	Tally	Frequency
Hamburger		
Hot Dog		
Pizza Slice		

D. Displaying the Data

Once you have collected your data, you may want to display the data in an interesting way for other people to read. Two common ways to display data are the pictograph and the bar graph.

Pictographs

A **pictograph** displays data by using small pictures or symbols. Each picture or symbol stands for a certain number of something. Pictographs are an interesting way of presenting data. Pictographs are also easy for most people to read and interpret.

Look at this pictograph:

Favourite Ice Cream Flavours of Grade 4's	
Vanilla	
Chocolate	
Orange	
Strawberry	
 = **2 students**	

1. Answer the following questions about this pictograph.

   a. What is this pictograph about?_____

   The favourite ice cream flavours of Grade Four students.

b. What does each  stand for? ***2 students***

c. What does  stand for? ***1 student***

d. How many students were surveyed? ***26 students***

e. How many students prefer chocolate ice cream? ***10 students***

f. How many more students prefer strawberry than orange ice cream?

5 students

Things to remember about pictographs

- *Choose a symbol that is easy to draw.*
- *Make all the symbols the same size.*
- *Keep the symbols lined up one below the other.*
- *Explain what one of your symbols stands for in a box at the bottom of the graph.*
- *Write a title at the top of the pictograph.*

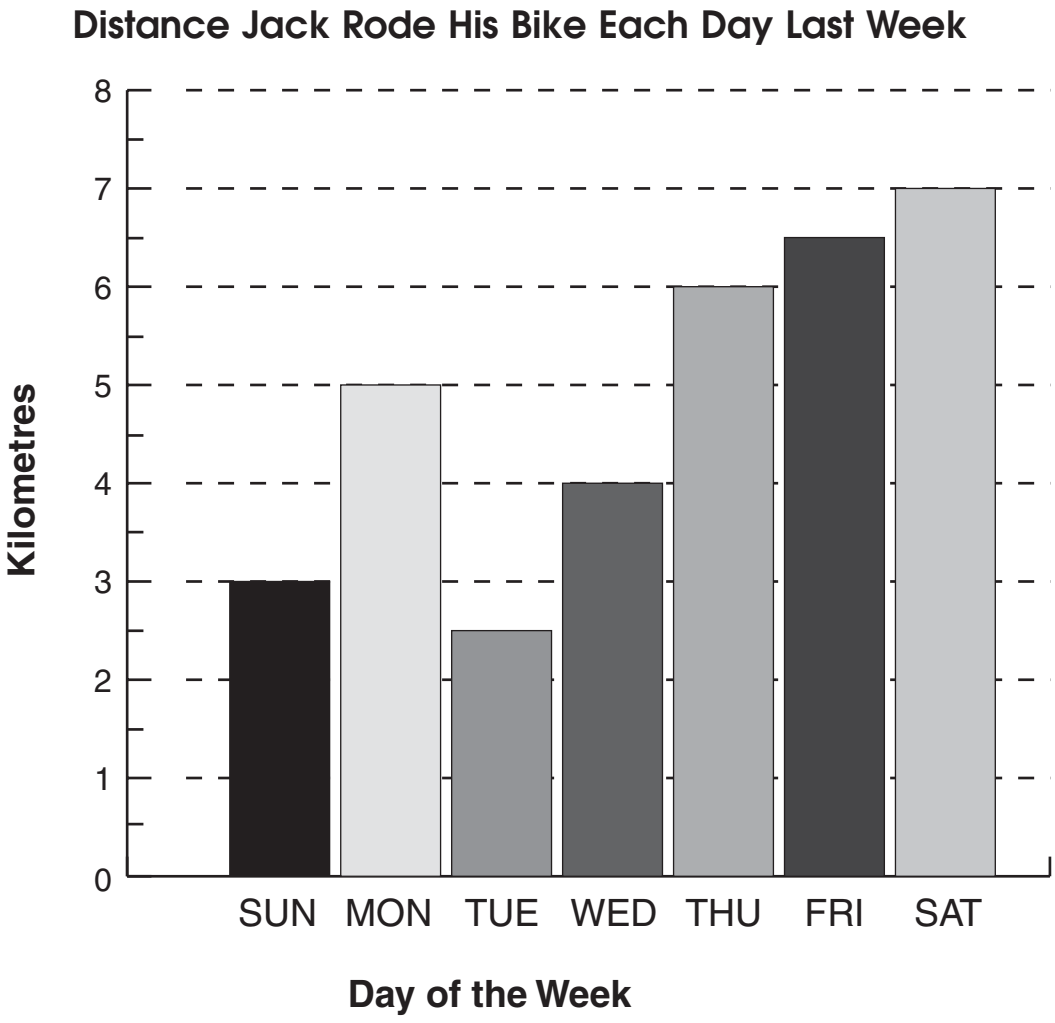
The title must be easily understood and make sense to the reader.

Bar Graphs

A **bar graph** displays data by using vertical or horizontal bars that are coloured or shaded. Bar graphs are very good for comparing data. A bar graph is also colourful and easy to make. You need a ruler and a coloured crayon or felt.

Look at the following bar graph. Notice how it was made. A bar graph has two **axes**. These are the two black lines. One axis is **horizontal** across the page. The other axis is **vertical** and runs up and down.

All of the bars are the same width. All of the spaces between the bars are the same width. Also note that a space is left between the vertical axis and the first bar. The bars should always be drawn using a ruler.



2. Answer the following questions about this bar graph on the previous page.

   a. What is this bar graph about?

   The graph shows the distance Jack rode his bicycle each day for one week.

   b. On which three days did Jack ride the shortest distances?

   Sunday, Tuesday, Wednesday

   c. How much further did Jack ride on Friday than on Sunday?

   3.5 km

   d. How much further did Jack ride on Friday than on Thursday?

   .5 km

   e. Is Jack improving or getting worse at long distance bike riding? Tell how you know.

   He is improving. The number of kilometres that he rides each day is increasing.

Things to remember about bar graphs:

- *Make all bars the same width. Use a ruler.*
- *All spaces between the bars should be equal.*
- *Leave a space between the vertical axis and the first bar.*
- *Be sure to add a title at the top.*
- *Be sure to label each axis.*
- *Don't forget to colour the bars!*

Congratulations!

You have completed the work for W1 - Lessons 1 to 5 of the Preview/Review course for Math 4.

Now, it's time to check up on what you have learned. Today, you will write a quiz that reviews the concepts covered in W1 - Lessons 1 to 5.

Before you do the quiz, you may want to go back and look over the work you just completed.

Tell your teacher when you are ready to begin writing this quiz. Good luck!