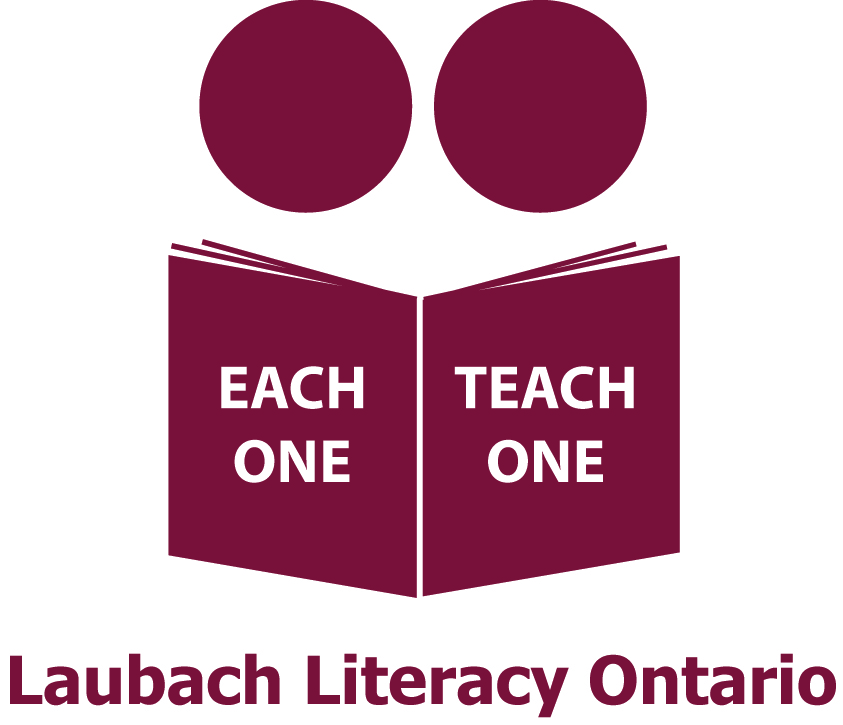
Understanding Basic Graphs and Charts 1

Instructor Guide



©2016 Laubach Literacy Ontario

This Employment Ontario project is funded in part by the Government of Canada and the Government of Ontario and through the Canada Ontario Job Fund Agreement.



## Introduction

In the workplace, one will often find many different types of numerical information stored in graphs and charts. Reading graphs and charts is an important skill to have when working in any type of job, be you a cashier, a store manager, or a CEO.

In this section you will:

* Learn about a variety of simple graphs: what they show, how they are used, what they look like, and how to read them.
* Evaluate, predict and apply data displayed in graphs

Note: This section is split into two parts. This lesson is the first part of two in Understanding Basic Charts and Graphs.

## Part 1: Bar Graphs

Lesson

* What do they show?
  + Use bars to represent amounts
  + The length of each bar represents a quantity
  + When read together, these bars *compare* quantities
* They can be used to…
  + Show the $ value of sales in different months
    - e.g. they sold $200 worth of hats in July, and $300 worth of hats in August
  + Compare how much was produced in different weeks
    - e.g. they produced 50 hats during Week 1, and 60 hats during Week 2
  + Compare how much of different products were sold
    - e.g. they sold 4 hats yesterday, and 7 hats today
* What do they look like?
  + They can extend vertically or horizontally
  + They may display data in a single bar, stack data within the same bar, or group related bars together
* How to read them:
  + Locate the title
  + Find the x-axis (usually displays categories) and y-axis (usually displays quantities)
  + Use the legend to identify categories
  + Scan the graph for any other types of information, like data labels

Activity

**Activity 1** - The students will answer the following questions in their workbooks (answers in italics).

1. The graph represents the sales of which product? - *watches*
2. Which year does the information on the graph represent? *- 2015*
3. How many employees' sales are being compared? *– 5 employees*
4. How many units did Missy sell? *– 15 units*
5. Who sold the most number of units? *­- Abbie*
6. Who sold the least number of units? *– Liam*

Discussion

**Bias in portraying data**

How does decreasing/increasing the range of values along the x-axis or y-axis change how we perceive data? How can these manipulations be used to favourably support an author's point of view?

Example:

Three friends go bowling. Robyn and Grant graph their scores. Can you tell who made each graph? (Answer: Robyn made Graph 1, Grant made Graph 2)

## Part 2: Circle Graphs

Lesson

* What do they show?
  + Used to represent the parts of something that make up a whole (or percentages)
  + The circle represents the whole, and parts (or proportions) of the whole are depicted as segments of the circle.
  + Other names for a circle graph are "pie graphs" or "pie charts"
* They can be used to…
  + Show which products were purchased the most
    - e.g. tennis balls made up %20 of the month's total sales
  + Compare the amount of time spent on different activities over a set timespan
    - e.g. Jack spent 2 hours sorting inventory, 1 hour reorganizing the till, and 2 hours cleaning the washrooms and floors during his 5 hour shift at the Tennis Store
* What do they look like?
  + Single or multiple circles may be used
  + When more than one circle is used, the smaller circle displays information about a portion of the larger circle
  + Information about pieces of the circle may be placed directly on the circle, or in a legend outside of the circle
* How to read them:
  + Locate the title
  + Find the legend, if there is one, and use it to identify each segment of the circle
  + Scan the circle for any other information (data labels on circle graphs often contain a lot of important information, such as percentages, numbers, etc.)

Activities

**Activity 2** - The students will answer the following questions in their workbooks (answers in italics).

1. In your own words, summarize what the graph displays. Include information about what the whole and segments represent.
2. Why might a town or county create this type of graph?
3. Which part of town has the greatest number of residents? *- Downtown*
4. Which part of town has the least number of residents? *- Westside*
5. If Peach County has a total population of 10 000, how many people live in Riverside? *– 1 780 people*

**Activity 3** - Using the template in their workbooks, students will create a circle graph that displays how they spend their time in a day. They will use the table to organize their data, and then fill in the empty circle graph.

## Part 3: Line Graphs

Lesson

* What do they show?
  + Points on a line graph represent quantities
  + These points are connected by a single line or by a multitude of smaller lines
  + The shape and direction of lines show how quantities change
  + These quantities may be just about anything: people, money, animals, weather events, etc.
* They can be used to…
  + Show how quantities change over time
    - e.g. the population of Brantford grew from 90 000 to 91 000 over a period of 2 years
    - e.g. the number of Brantford citizens under the age of 19 has decreased steadily over the past 10 years
  + Show trends in data and predict future values by adding a *trend line*
* What do they look like?
  + They contain two axis (like a bar graph), and extend horizontally
  + The x-axis typically represents units of time
  + The y-axis marks whatever is being measured
    - e.g. quantity, quality, speed, distance, etc.
  + Multiple quantities can be displayed on a single graph by drawing more than one line on the same pair of axis
* How to read them:
  + Locate the title
  + Find the x-axis and the y-axis. The x-axis is almost always displayed from right to left, the y-axis up and down.
  + Use the legend to identify what information each line represents
  + Scan the graph for any additional information, such as data labels

Activities

**Activity 4** - The students will answer the following questions in their workbooks (answers in italics).

1. Where have these populations counts taken place? *- Burlington*
2. How many brown squirrels were there in 2014? *– 1000*
3. During what two years was the population of red squirrels the same? How many red squirrels were there? *– 2010 and 2016, 1000*
4. During what year were the populations of brown squirrels and red squirrels the same? *- 2012*
5. What was the total population of both red squirrels and brown squirrels in 2010? *- 1500*
6. Draw a line showing the general trend in the population of brown squirrels. Based on this trend, predict growth/decline in the population of brown squirrels in the following years.

**Activity 5 (Technology Application)** – Have the students test their graph reading skills by solving interactive challenge questions. The online quiz is available at the following web address:

<http://www.mathgoodies.com/lessons/graphs/challenge_unit11.html>

Discussion

**Predicting Data**

Because line graphs typically compare data over a span of time, line graphs can be used to make predictions about what will happen in the future.

How might you use a line graph to make a prediction? What strategy would you use to make a prediction, and why would you use that strategy?

Why is it more difficult to make predictions based on a bar graph or a circle graph?

Example: Discuss the graph on the slide. Have students predict the number of laptop sales for July if the current *trend* continues.