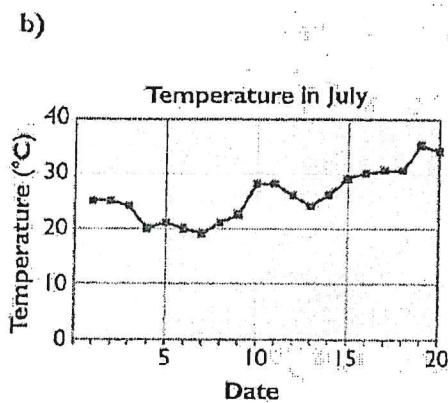
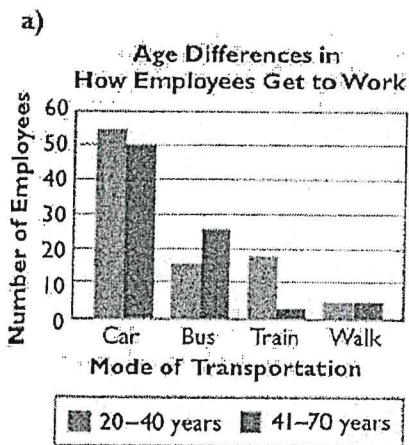
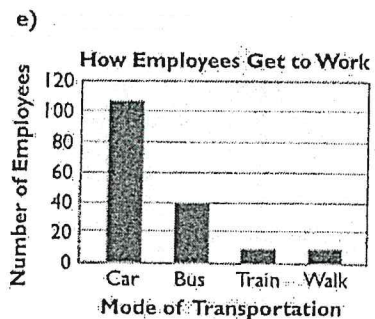
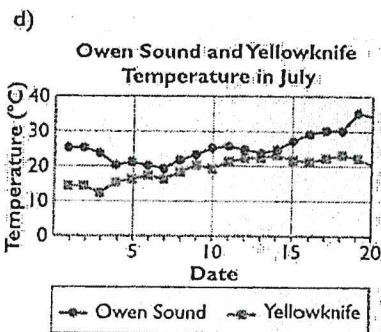
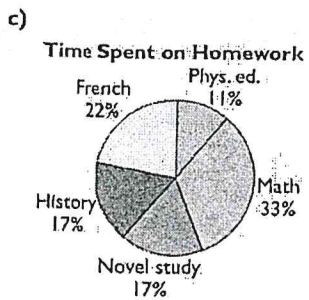


Interpreting Graphs Practice | MEL4E

1) Identify the type of graph, explain why each graph is suitable for the data displayed.



Type: Double Bar-Graph	Type: Line Graph
Reason: Comparing 2 sets of data.	Reason: Seeing how temperature changes over time.

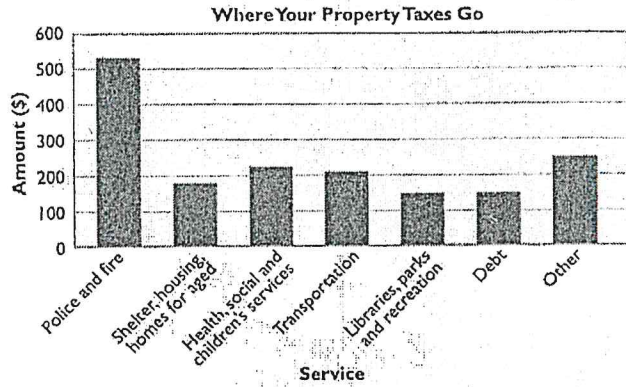


c) Type: Circle Graph	d) Type: Double-Line Graph
Reason: Divides up time spent as part of a whole.	Reason: Compares how two sets of temperatures change over time.

e) Bar Graph - comparing 1 set of data.

Interpreting Graphs Practice | MEL4E

2) The city art department could display the distribution of a certain amount of property taxes in a bar graph, instead of using the circle graph in our note.



a) How are the circle graphs and bar graphs alike? How are they different?

Similarities	Differences
<ul style="list-style-type: none"> - both easy to read - both show largest to smallest categories 	<ul style="list-style-type: none"> - circle graph gives more info at a single graph.

bar graph uses amount, circle uses percents.

b) Which graph do you think is more suitable for displaying the data? Explain.

3) We will be using percentages a lot with circle graphs. Express each of the following as a percent.
Hint: Divide and multiply by 100.

- a) 25 out of 100 people
- c) 50 out of 500 cars
- e) 2 out of 3 houses
- g) 7 out of 10 drivers

- b) 50 out of 200 light bulbs
- d) 50 out of 75 students
- f) 3 out of 5 dentists
- h) 1 out of 4 telephones

$$a) \frac{25}{100} \times 100\% = 25\%$$

$$b) \frac{50}{200} \times 100\% = 25\%$$

$$c) \frac{50}{500} \times 100\% = 10\%$$

$$d) 66.7\%$$

$$e) 66.7\%$$

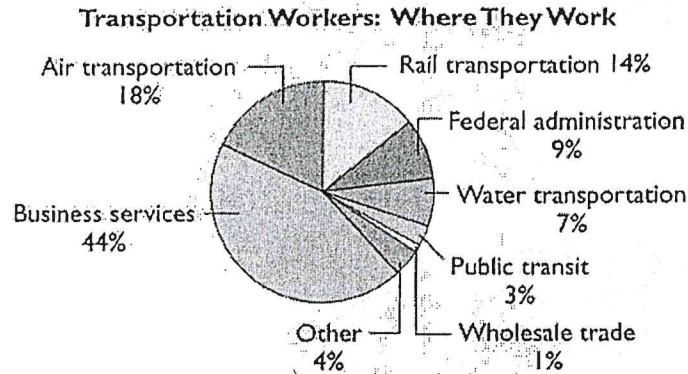
$$f) 60\%$$

$$g) 70\%$$

$$h) 25\%$$

Interpreting Graphs Practice | MEL4E

4) In our note, we did a bar graph showing where transportation workers are employed. Displaying only these seven areas of employment in a circle graph would not be meaningful. But you could display these seven areas and "Other" as percents of the total in the pie graph.



a) What do the percentages add to now?

100%. (Before 96% without other)

b) Let's say 200,000 workers in Canada work in the transportation field. Determine the number of workers in each sector.

Sector	Percentage	Number of Workers
Business Services	44	$0.44 \times 200,000 = 88,000$
Air transportation	18	$0.18 \times 200,000 = 36,000$
Rail transportation	14	28,000
Federal administration	9	18,000
Water transportation	7	14,000
Public transit	3	6,000
Wholesale trade	1	2,000
Other	4	8,000
Totals	100%	200,000

✓ ✓

Interpreting Graphs | MEL4E

When you want to describe a memorable scene, you can use words. However, a picture often shows it better. You can arrange data or information in a table. However, there are a couple of reasons why a graph might be better:

- Provides a quick impression
- Makes it easier to see trends

What are some types of graphs that you have used/seen?

- Line graph
- Circle Graph
- Bar Graph
- Double-Bar Graphs
- Histograms

Example: James works for a newspaper. He is writing an article about the cost of clearing snow from cities in Canada. The cost is obviously related to the amount of snowfall. James found the following information off the Statistics Canada website.

City	Average Annual Snowfall (cm)
Vancouver	54.9
Calgary	135.4
Regina	107.4
Toronto	135.0
Ottawa	221.5
Quebec City	337.0
Halifax	261.4

James decides to use a **bar graph** in his article. Bar graphs are used to **compare quantities**. Equal spaces separate the bars. Those with vertical bars are sometimes called **column graphs**.

a) What is shown on the vertical axis?

Snowfall in 50cm increments

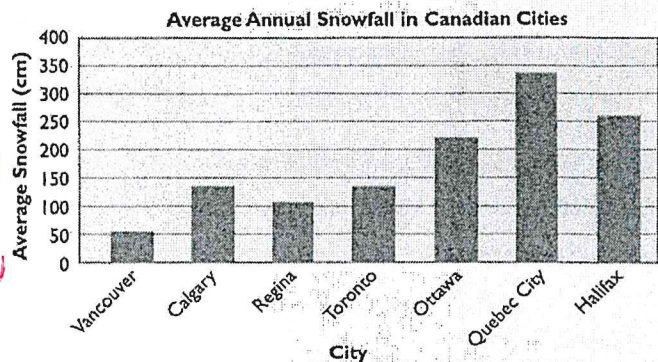
b) What is shown on the horizontal axis?

Cities

WHOLE SCALE SHOWN

c) Which city has the greatest and least amount of snowfall?

Greatest - Quebec City Least - Vancouver



d) Which two cities are closest in average snowfall?

Toronto & Calgary

e) Which way of presenting the data is easier to read – the table above, or the bar graph? Explain.

Bar Graph

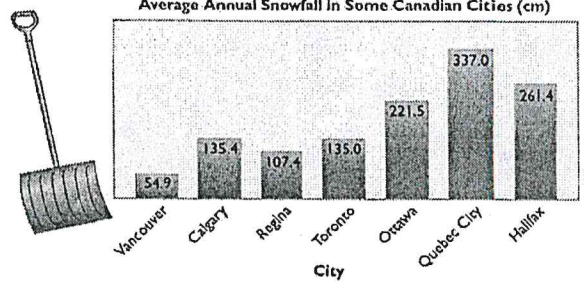
You can visually see the data and compare

Table

Gives the exact values.

Interpreting Graphs | MEL4E

f) James sends the bar graph to the art department at the newspaper. The graphic artist draws the graph so that it catches the attention of the readers. What are some advantages/disadvantages of this presentation?



Disadvantage

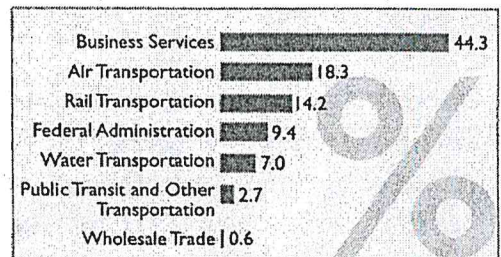
No more scale

Advantage

Specific values can now be seen.

Example: A government Web site has information about various jobs. In the section about transportation workers, a bar graph shows in what areas these employees work. The bars are drawn horizontally.

Transportation Workers: Where They Work



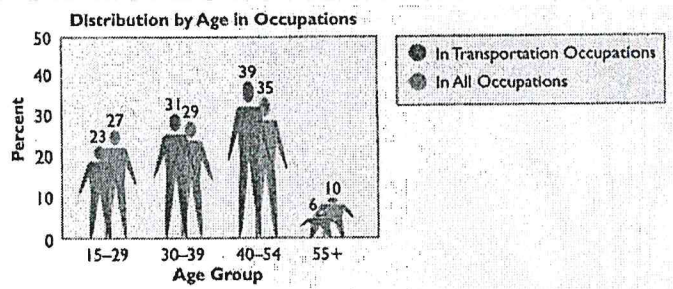
a) What do the numbers at the right of the bars represent?

% of workers ~~are~~ in each sector

b) What information might you add to the graph to make it easier to read?

Maybe add a (%) after each number.

Example: This graph shows the percent of the population in various age groups working in transportation occupations and in all occupations.



a) What is the total percent of people in the transportation industry?

$$23 + 31 + 39 + 6 = 99\%$$

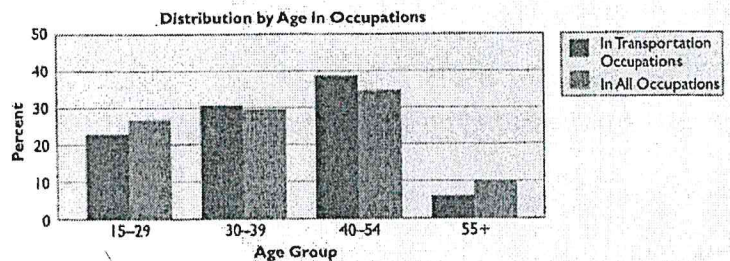
b) What is the total percent of people in all occupations?

$$27 + 29 + 35 + 10 = 101\%$$

c) Why do you think the totals are not 100%?

Rounding

d) This data could have also been displayed in a **double bar graph**. Double bar graphs are used to compare two similar sets of data. Which graph do you find easier to understand? Why?

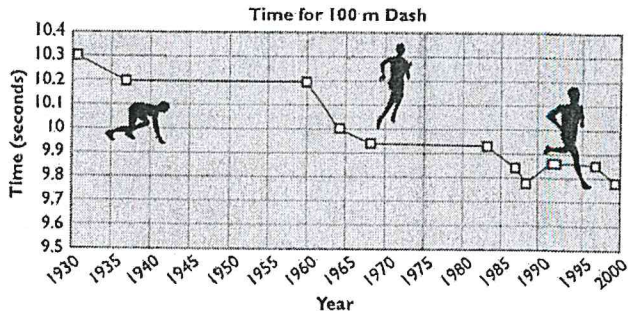


Answers may vary, but the top graph has exact values.

Interpreting Graphs | MEL4E

Example: Karen is making a poster for an independent study project for physical education class. She found information in the newspaper on times taken to run the 100m dash in several years 1930 to 1999.

Karen used a **line graph** to display the information. On a line graph, line segments are used to join data points. Line graphs often show a change over time.



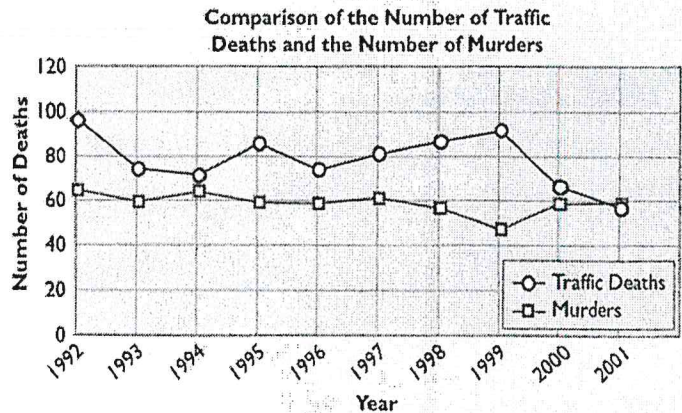
a) Between which two years was there the greatest change in the time for the 100m dash? How do you know?

1960-1965, the steepest line between points.

b) When was there an increase in the time for the 100m dash? How do you know? What might have caused the increase? Hint: The Seoul Olympics were in 1988.

1988-1992: Many athletes suspended for steroid use & times were wiped out.

Example: Frank is studying the effect of various forms of stress on people. He thinks that stress due to a combination of poor economic conditions and political unrest may cause people to drive carelessly and to disagree violently with other people. He finds data on the number of people who have died in traffic accidents and the number of murders committed in the same time period.



Frank uses a **double line graph** to display the data. A double line graph is used to compare two sets of data that change over time.

a) What trends should he look for in the graph?

Similar ups and downs.

b) What trends do you see?

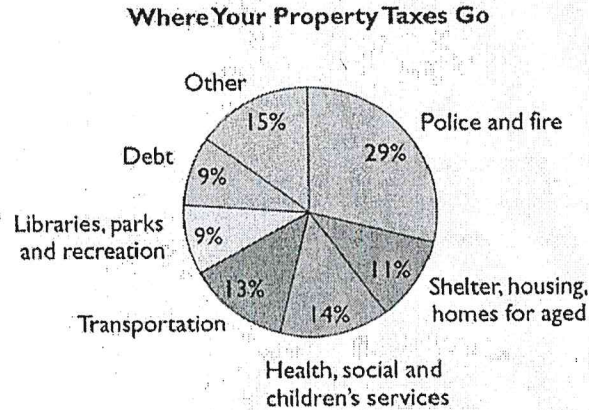
It is the opposite that happens, generally.

c) If Frank is correct, more people drive carelessly at the same time as more people disagree violently. Do you think the graph shows this to be true? Explain.

Frank's theory is not correct.

Interpreting Graphs | MEL4E

Example: A city presented its budget as a **pie graph or circle graph**. A circle graph has sectors that represent portions of a whole. In this pie graph for property taxes, each sector represents the property tax paid for one area as a percent of the total collected from all property owners.



- a) Which area receives the greatest percent of taxes? *Police & Fire*
- b) Which two areas receive the same percent of taxes? *Debt & Libraries, ...*
- c) What is the total of all the percentages shown on the graph? Why would this be?
 $15 + 29 + 11 + 14 + 13 + 9 + 9 = 100\%$. (represents whole circle)
- d) A homeowner pays a property tax of \$3,000. How many of these tax dollars are spent on police and fire departments?

What is 29% of \$3000

$$0.29 \times 3000 = \$870 \text{ in taxes to police and fire}$$