CHARTS & GRAPHS

The terms *chart* and *graph* are used interchangeably outside of the scientific and mathematical disciplines. The terms describe tools that present information in a visual format; they also include diagrams, tables and schedules and are often used to show relationships between mathematical data.

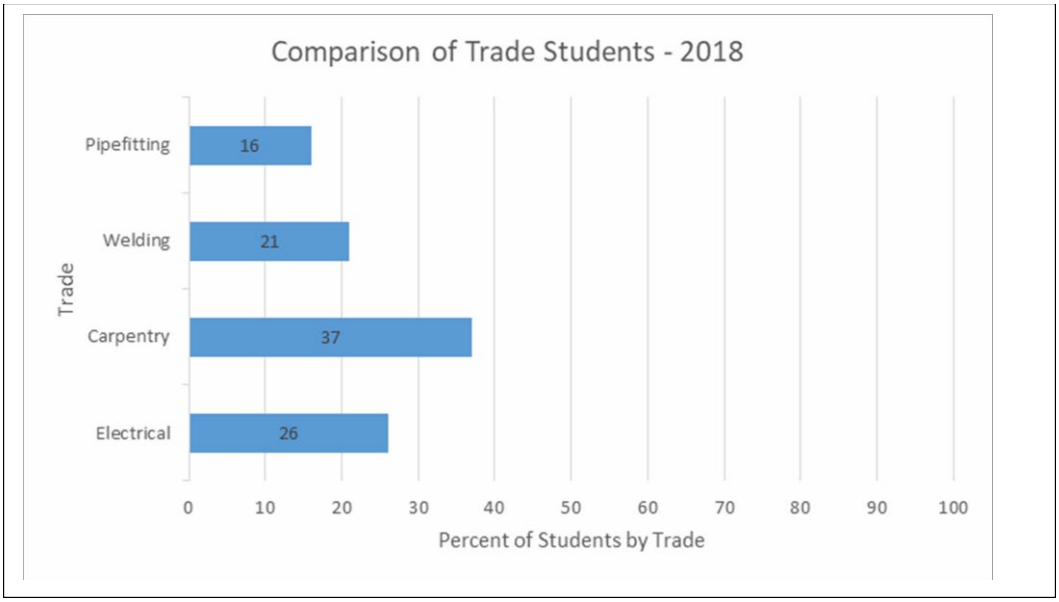
Three common tools are bar graphs, line graphs and circle graphs. Circle graphs are often called pie charts.

KEY POINTS

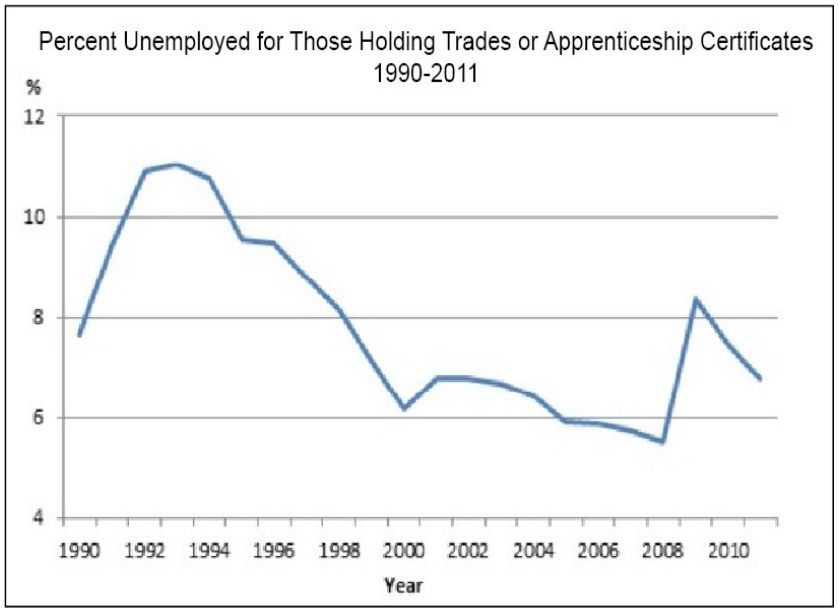
Charts and Graphs

- include diagrams, tables, schedules and other tools
- present information in visual format
- often show relationships or comparisons between or among data
- may present information using scales or units
- usually have titles that indicate the purpose of the display and what is being represented
- usually have a legend or labels that explain the meaning of colours or shading, if there are any used
- charts and graphs may use reference lines known as x and y *axis.* The axes are fixed lines used to show the position of a point. For example you may look at a graph that plots distance on the y axis against time on the x axis

Bar charts/graphs use bars to represent categories and the height or length of the bars to show quantity. **(NOTE**: in this graph the *Y axis* represent trades and the *X axis* represents percent of students training in each trade shown.)



Line graphs are graphs with points connected by lines to show how something changes in value - over time or as something else changes.

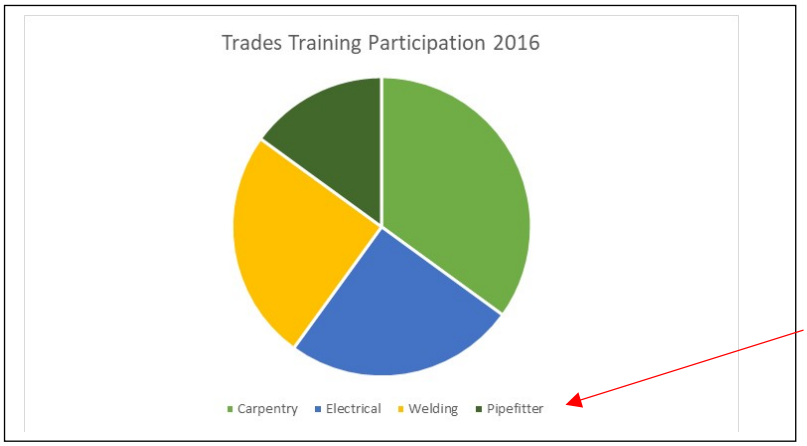


Statistics Canada, Chart 6.5 – Percent Unemployed for Those Holding Trades or Apprenticeship Certificates, 1990-2011. Reproduced and distributed on an "as is" basis with the permission of Statistics Canada

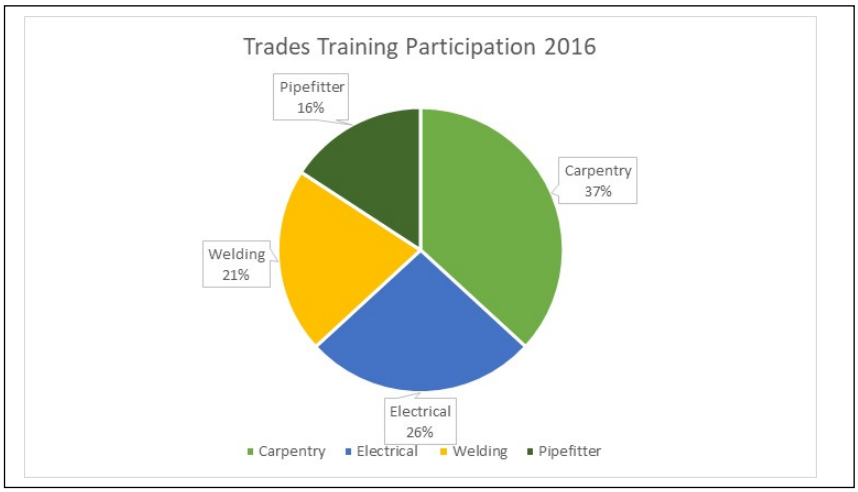
Pie Charts:

- are circles divided into wedges, like a pie
- the circle = 100% of the data in the pie chart
- sections represent fractions of the data presented
- enable comparison of sizes or relationships amongst categories
- may use numbers near or in the circle, or shown in a legend, to show amounts
- may use colours to describe the size of the wedges
    - when colours are used, without numbers, you are only able to estimate the relationships amongst the data

Sample Pie Chart – No numerical data shown



Sample Pie Chart – Numerical data shown



STEPS

1. Decide what you need to find out.

2. Identify what the chart/graph represents by looking for the title and any information in a legend or labels on the axes or in notes below the chart/graph.

3. Identify the type of chart/graph you are looking at.
   a. **Line graph**
      - check the title and labels for each axis to see what is being compared
      - read across the X axis (horizontal) to find the data grouping you are looking for
      - read straight up the graph until you find the point on the line that is directly above the data grouping you are looking at
      - read back to the left, level with the point on the line, to find the value of the point of the line on the Y axis (vertical)
      - if you find you are between 2 data points on the Y axis, make your best estimate as to the value of the point

   b. **Bar graph**
      Bar graphs may display information vertically or horizontally.
      - check the title and any labels on each axis to see what is being compared
      - scan the axis to find the data grouping you are looking for
      - scan up or along the bar related to the data grouping, until you get to the end of the bar
      - scan back to the data that is level with the top of the bar you are interested in, to find the value of the end of the bar
      - if you find you are between 2 data points on the axis, make your best estimate as to the value of the point

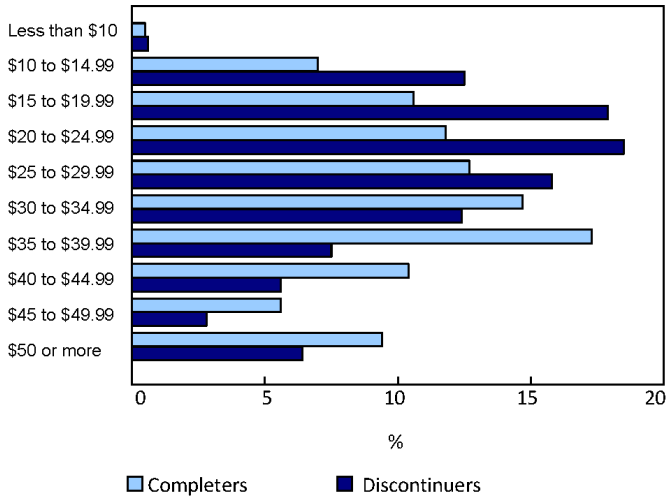
c. **Pie chart**
   - check the title, legend, numbers, or labels shown on or near the circle to see what is being compared.
   - Read the value of the segment(s) of the chart you are interested in.

4. Decide what information you can draw from the chart/graph:
   a. Are there increases or decreases in values?
   b. Can you identify trends or make predictions?
   c. Is there anything unexpected in the data, such as a spike or a gap, which indicates there may be a problem that should be addressed or a change that needs to be made?
   d. Are there notes that clarify any of the information?

EXAMPLE

Research has shown that one benefit of completing an apprenticeship program is a higher average annual income, compared with those who did not complete.

Chart 1
Distribution of grouped hourly wages for paid employees by apprentice status, Canada



Note(s): Use results for "Less than $10.00" category with caution.
Source(s): National Apprenticeship Survey, 2015.

Statistics Canada (March 29,2017). Chart 1 Distribution of grouped hourly wages for paid employees by apprentice status, Canada [Chart]. In Completing an apprenticeship in Canada yields benefits 2015. Retrieved from: https://www150.statcan.gc.ca/n1/en/daily-quotidien/170329/dq170329b-eng.pdf?st=pEtox4cZ.

- The bar graph above has a title that explains what information you can find in the graph.
- There are notes included below the graph that clarify how complete the information is.
- A conclusion that might be drawn from the graph is that, in all trades, individuals who complete their trades training are more likely to be paid higher wages.
- A caution in making a conclusion from the data in the graph is that, as the notes explain, the data in the less than $10.00 category is not as reliable as the data in the other categories.

Think you understand how graphs and charts work? Try it yourself on the next page.

USING THE SKILL

In the Workplace: Chart and graphs provide a graphical illustration of data and quickly convey important information that can be used to inform workplace activities.

QUESTIONS

Use the bar chart on the next page to answer these questions:

1. For what years is the data in this chart most relevant?

2. What organization produced the chart?

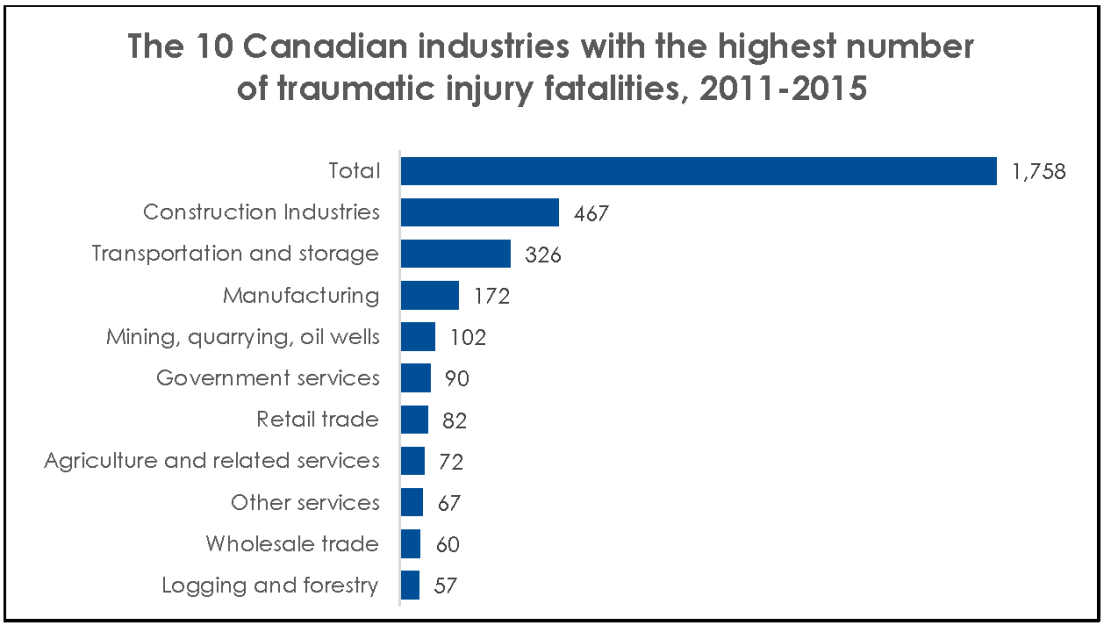
3. What information is found on the y axis?

4. What percentage of the workforce is included in the data in this bar chart?

5. Which fatalities are not included in the data represented in the chart?

6. What is the total number of fatalities reported by the three industries with the fewest fatalities?

7. What is one conclusion you might make, based on the information in the chart?



Source: Association of Workers' Compensation Boards of Canada (AWCBC)
Note: Excludes fatalities that were "Not coded" by occupation. Workers' compensation numbers do not fully capture the whole work force. As of 2015, 85 per cent of workers in Canada were covered. Among provinces, this coverage ranges from 73 per cent in Nova Scotia to 98 per cent in British Columbia.

REFLECTION

How do you use graphs and charts at work? When do you use them?