

41

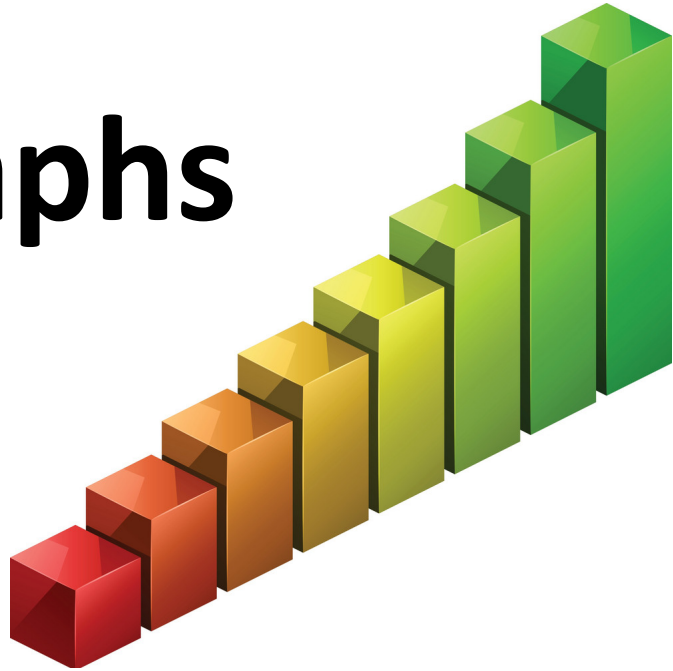
Recall – What Makes A Good Graph

All graphs must:

- ✓ Drawn Neatly and Clearly
- ✓ Drawn as Big as Possible
- ✓ Drawn using a ruler, compass, protractor, etc...
- ✓ Graph Title / Caption
- ✓ Axes Labeled w/ Units
- ✓ Appropriate Scale w/ Consistent Spacing.
- ✓ Legend / Colour Coded

42

Bar Graphs



43

How to Make a Bar Graph

- When drawing a vertical bar graph (i.e. up and down), the horizontal axis does not have a scale: it just the names of each bar.
- The vertical axis will need a scale. For this course, each vertical scale must start at zero, and end it just above the highest data value.

- For example, if your data consisted of the information below, you would start your vertical axis at zero and the top value might be 55 if increments go up by 5, or 56 if increments go up by 2.

| Colour | Number |
|--------|--------|
| Blue | 50 |
| Green | 45 |
| Red | 54 |
| Orange | 49 |
| Yellow | 52 |

- **For this course, the bars in the graph should not be coloured with individual colours, but all one colour. A highlighter is fine, or they can be simply shaded with a pencil.**

44

Sample Problem – Bar Graphs

The 2001 Canadian census data listed the following approximate populations of various cities, to the nearest thousand.

| POPULATION OF CANADIAN CITIES, 2001 | | | | | | | |
|-------------------------------------|-----------|---------|----------|----------|-----------|----------|--------|
| City | Vancouver | Calgary | Victoria | Edmonton | Saskatoon | Winnipeg | Regina |
| Population (in thousands) | 1987 | 951 | 312 | 938 | 197 | 671 | 193 |

- Graph the data on a bar graph.
- Is there a general trend in the data?

45

How to Make a Double Bar Graph

A double bar graph follows the same system as a single bar graph, but with the following additions...

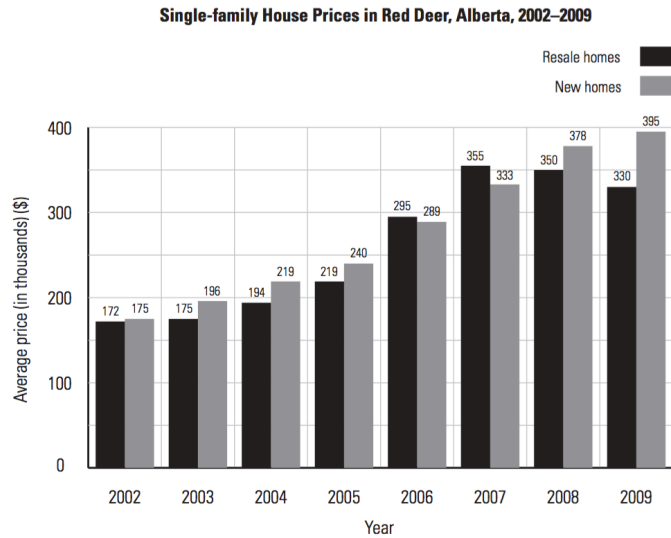
- The pair of bars must be the same width and touching each other.
- There must be regular space between sets of bars, just like a single bar graph.
- Each set needs to be coloured/shaded differently to tell the bars apart.
- There needs to be a legend to indicate what different bars/colours represent.

46

Sample Problem – Bar Graphs

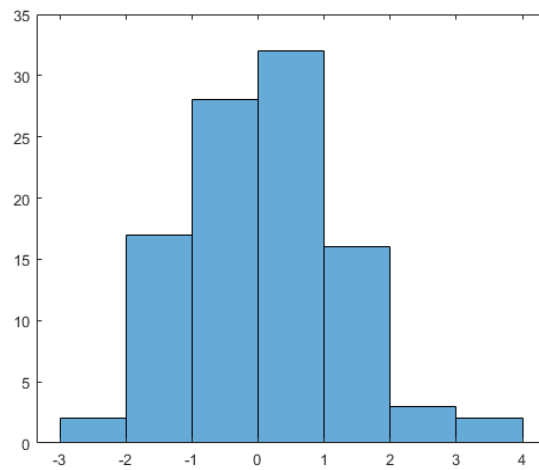
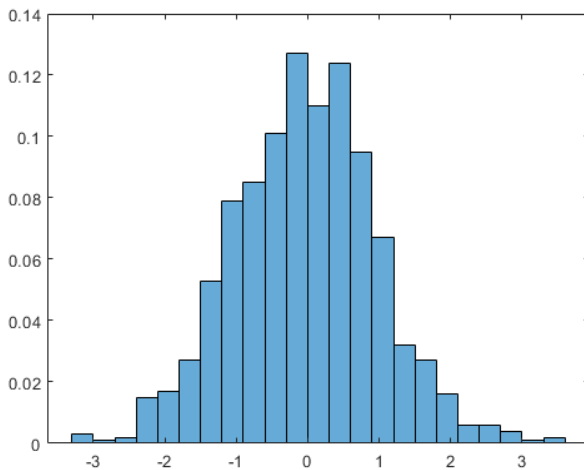
Roger is a real estate agent in Red Deer, Alberta. The graph below compares the average house prices of new single-family homes and resale (not new) single-family homes.

- What was the average price of a new single-family home in 2005?
- Between what years was there a drop in the price of resale single-family homes?
- What is the general trend in the differences in prices (which cost more/less) of the two types of units? In which years was this not so?



47

Histograms



52

How to Make a Histogram

A histogram graph follows the same system as a bar graph, but with the following changes...

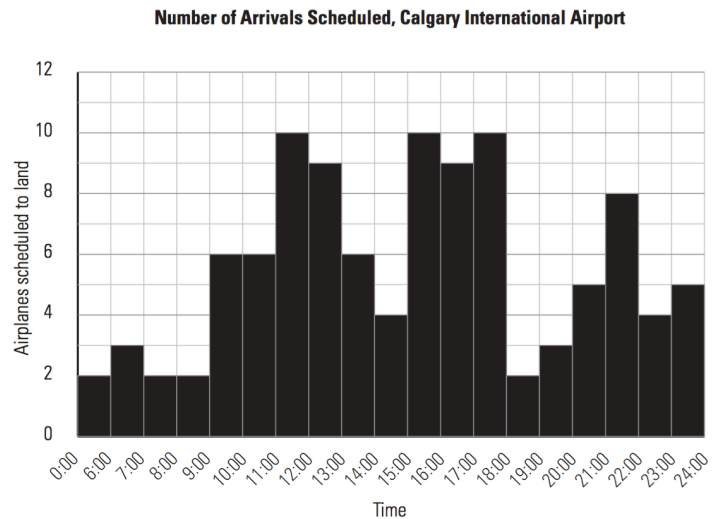
- The data used to plot a histogram comes from a tally chart or a frequency table. A tally chart lists the classes to be plotted and has tally marks for each time there is a piece of data in that class.
 - Sometimes you may need to create your own classes or count the number of items within each class before plotting.
- Since the data is continuous there are no spaces between adjacent bars.
- The width of each bar (i.e. class) is the same.

53

Sample Problem – Histograms

The histogram below shows the number of airplanes scheduled to arrive at the Calgary International Airport on a particular day.

- How many airplanes are scheduled to arrive between 2:00 pm and 3:00 pm?
- What are the busiest times at the airport? How many airplanes are scheduled to arrive at these times?
- What is the quietest time?
- Are any airplanes scheduled to arrive between 4:00 am and 5:00 am?



54

Sample Problem – Histograms

Isabella works as a server at a busy restaurant. She kept track of the amount of money she received in tips per table. Draw a histogram to represent the tips she received. What is more obvious from the histogram than in the table below?

| <i>Amount</i> | <i>Less than \$2.00</i> | <i>\$2.00–\$3.99</i> | <i>\$4.00–\$5.99</i> | <i>\$6.00–\$7.99</i> | <i>\$8.00–\$9.99</i> | <i>Over \$10.00</i> |
|------------------|-------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|
| Number of tables | 12 | 6 | 23 | 5 | 4 | 2 |

55

Circle Graphs



56

How to Make a Circle Graph

To plot a circle graph, the amount or percentage given must first be converted to degrees and then the appropriate angles are plotted. Follow these steps...

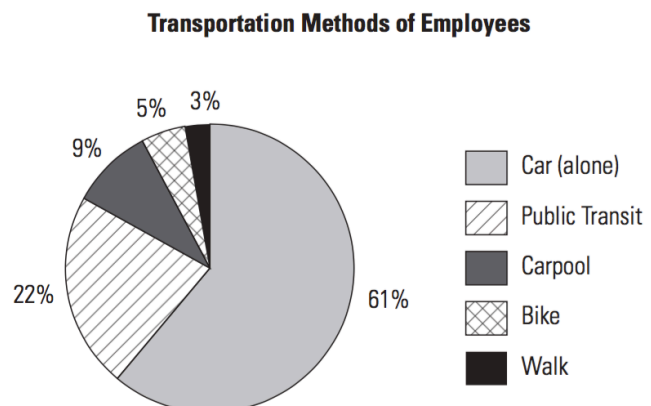
- 1) Determine the total amount of all the samples.
- 2) Divide each sample by the total amount to obtain a percentage.
 - A good double check is to add all the percents together...if done correctly you should get 100% or very very close to it.
- 3) Since every circle has a degree measure of 360° multiple the percent's by 360° to obtain the angle associated with each sample.
 - A good double check is to add all the angles together...if done correctly you should get 360° or very very close to it.
- 4) Draw a large circle and draw a line from the center to one side.
- 5) Using a protractor carefully measure each angle using the reference line above as your starting point.
- 6) Continue going around the circle using each new line as your next reference point until all angles are plotted
- 7) Label each segment or colour each segment accordingly with a matching legend. If the sectors are too small, a line pointing at the sector with the label can be used.
- 8) Often, the amounts given for each segment are also labeled (quantity or as a percent).
- 9) Don't forget to include a title explaining what the what the graph is illustrating.

57

Sample Problem – Circle Graphs

The following circle graph shows how people in Maxine's office building get to work. There are 350 people working in the building.

- a) What percentage of the people walk to work? How many people does this represent?
- b) What percentage of people come to work in a car? How many people is this?
- c) Consider those who carpool, walk, or bike. Is this more or less than the number who take public transport? How many more or less?



58

Sample Problem – Circle Graphs

Jasmine surveyed students at her college to find out how they commute to school. The results are shown in the table below. Create a circle graph of the data.

| SURVEY RESULTS: MODE OF TRANSPORTATION TO SCHOOL | | | | | | |
|---|--------------------|----------------|------------------|------------|----------------|-------------|
| <i>Means of travel</i> | <i>Car (alone)</i> | <i>Carpool</i> | <i>Motorbike</i> | <i>Bus</i> | <i>Bicycle</i> | <i>Walk</i> |
| Number of people | 75 | 20 | 5 | 75 | 10 | 15 |