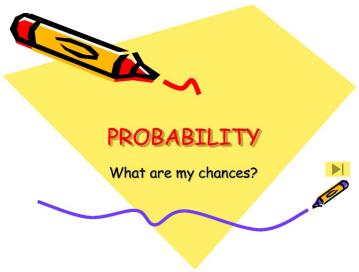
(Gr. 8)

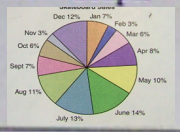
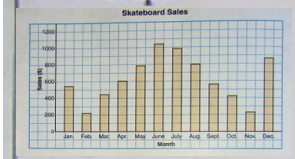
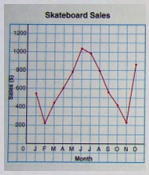
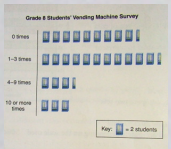
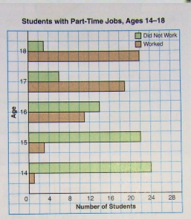
April 7,2016

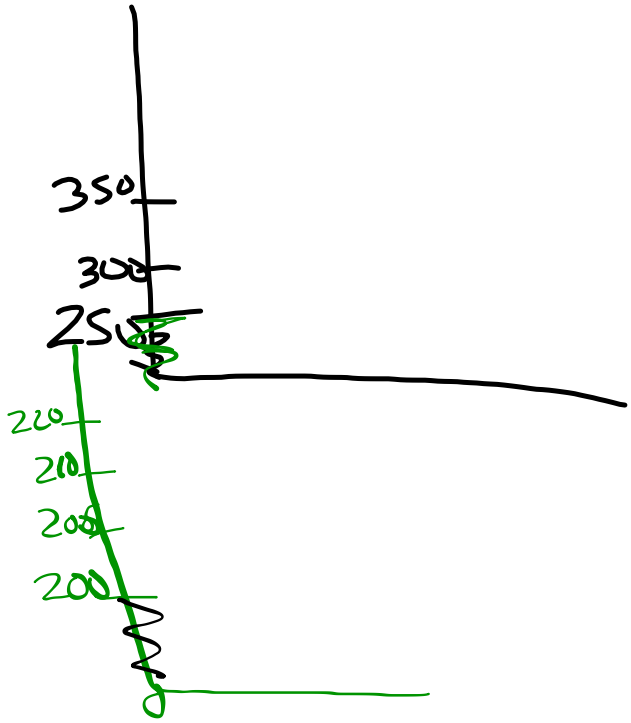
# Unit 7: Data Analysis & Probability



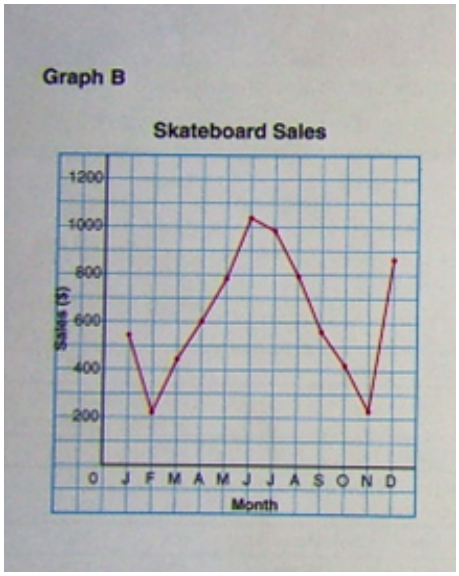
# Choosing an Appropriate Graph

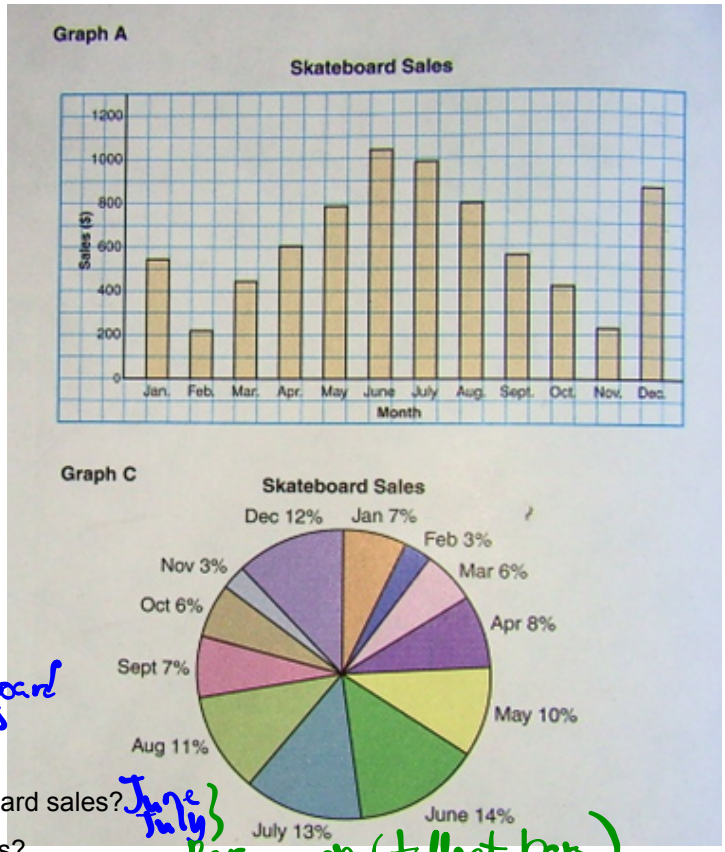
Also see page for more examples

| Type of Graph | Strengths | Limitations |
|---|---|---|
| Circle Graph  | • Shows parts of a whole<br>• Shows percents of the total<br>• Sizes of sectors compare parts of the whole | • Does not show data values and the total<br>• Difficult to draw accurately |
| Bar Graph   | • Lengths of bars compare data values<br>• Scale can be used to find the total<br>• Easy to draw | • May be difficult to read depending on scale used<br>• Does not show percents of the total for comparison |
| Line Graph   | • Easy to draw and to read<br>• Shows data changes over time<br>• Can be used to estimate values between or beyond data points | • Does not show parts of a whole<br>• Zig-zag pattern can be difficult to interpret |
| Pictograph page 384   | • Lengths of rows of symbols compare data values<br>• Graph is visually appealing<br>• Key can be used to find the total | • Large number of symbols make it difficult to read<br>• Does not show parts of a whole<br>• Difficult to draw |
| Double Bar Graph   | • Directly compares two sets of data<br>• Lengths of bars compare data values<br>• Scale can be used to find the total of each data set<br>• Easy to draw | • Can only be used to show discrete data countable<br>• May be difficult to read depending on scale used<br>• Two sets of data in one graph can be confusing |


350
300
250
220
210
200

Page 382




What do you know from each graph? Skateboard Sales

Which graph is the MOST helpful in

a) Which 2 months had the greater skateboard sales? June July

b) What is the range in the skateboard sales? Big - Small

c) What percent of skateboard sale occurred in May? Bar graph (fatbot bars)

c) 10% (circle graph only tell % of whole)

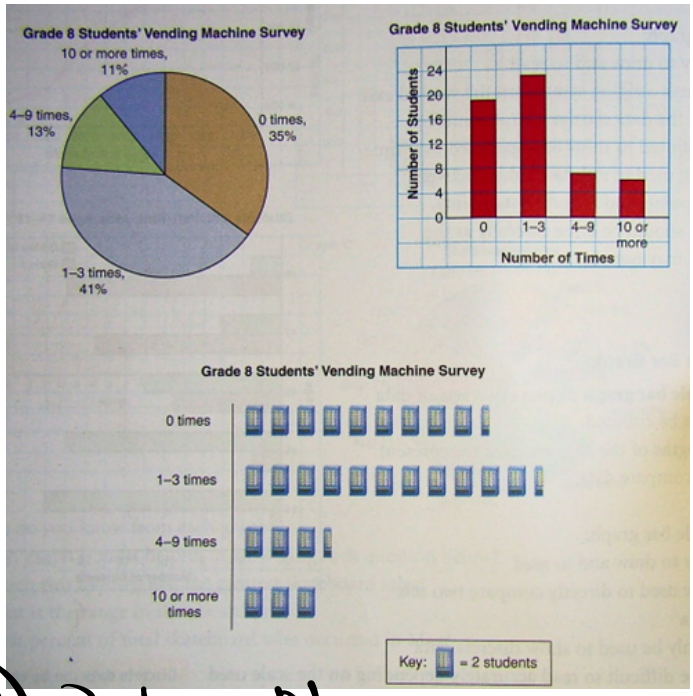
b) Range = June - Feb (Bar or Line) June 1050 Feb 200

Big Small

1050 - 200

850

Three students surveyed Grade 8 students in their school. They asked: "How many times did you use a vending machine last week: 0 times, 1-3 times, 4-9 times, or 10 or more times?" Amrit displayed the results on a circle graph.
Fred used a bar graph. Stella used a pictograph.
a) What are the strengths and limitations of each graph?
b) Which graph is appropriate? Justify your answer.




a) Circle → Easy to Read (Big Piece is most popular) 1-3 times
→ Don't tell % of grade 8 students!

b) Bar graph
→ Easy to read
→ 1-3 most popular
→ 23 students go 1-3 times a week
→ 5 students go 4-9
→ Read # of Students
Not # of students

Limitation → bars stop between scales is 1-3 times a week bar stopping at 23 or 22 people

c) Pictograph
→ appealing to look at
→ Easy to read
But Remember to use Scale
{ 1 machine = 2 people
$\frac{1}{2}$ machine = 1 person

Limitation → count vending machines

This table shows the favourite types of video games of the Grade 8 students at L'ecole Orleans.

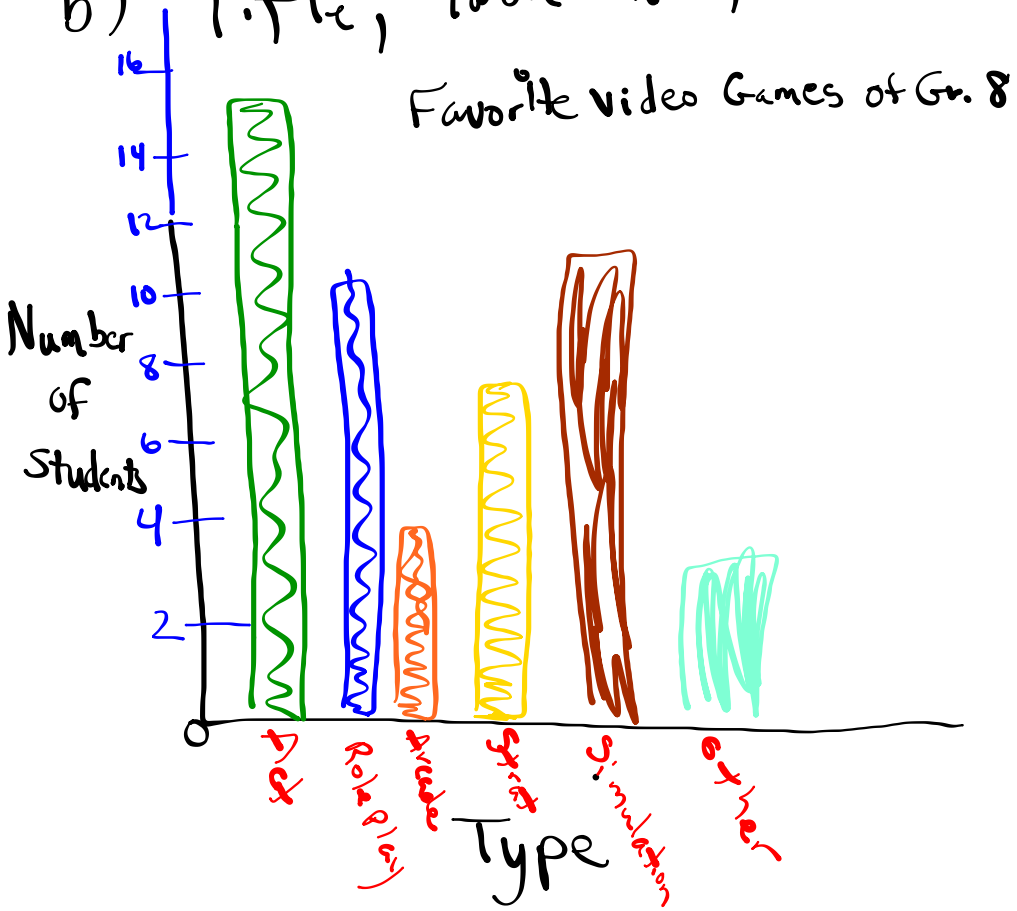
a) Graph these data. Justify your choice of graph.

b) What are the advantages and disadvantages of the graph you drew?

| Type | Number of Students |
|---|---|
| Action | 15 |
| Role Playing | 10 |
| Arcade | 4 |
| Strategy | 7 |
| Simulation | 11 |
| Other | 3 |

a) Bar Graph
→ x-axis can have the type
→ y-axis # of students
→ Scale count by 2

b) Title, lable axis, Scale



This table shows the favourite types of video games of the Grade 8 students at L'ecole Orleans.

a) Graph these data.
Justify your choice of graph.

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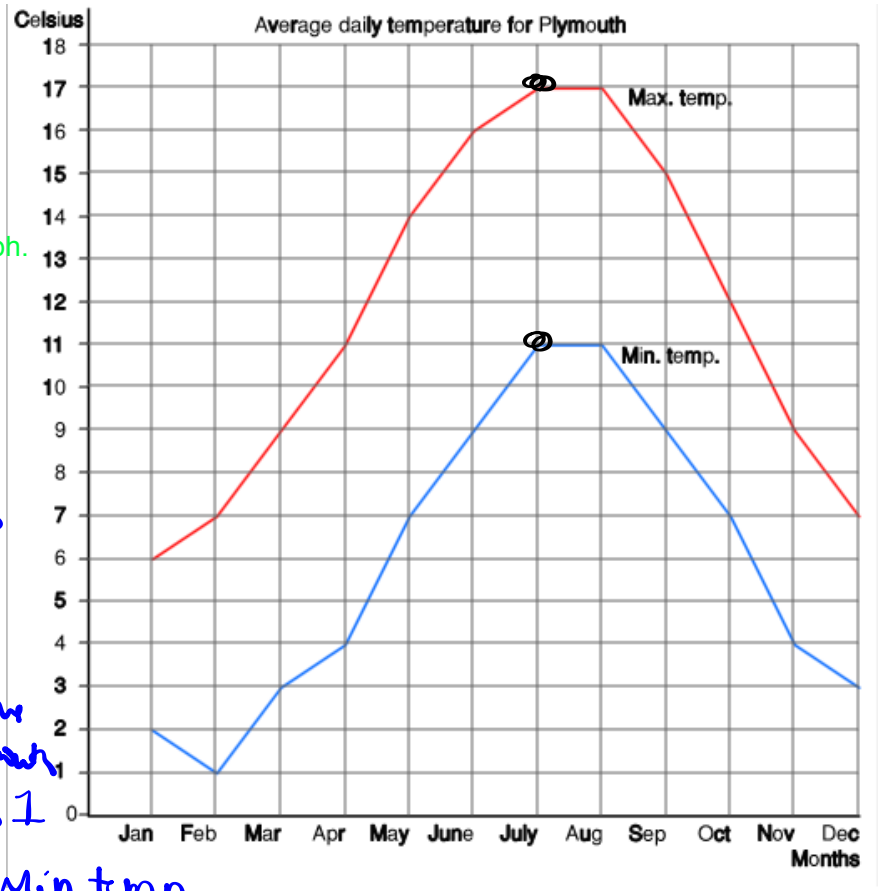
| Type | Number of Students |
|---|---|
| Action | 15 |
| Role Playing | 10 |
| Arcade | 4 |
| Strategy | 7 |
| Simulation | 11 |
| Other | 3 |

Total : 50

Action $\frac{15}{50} = \frac{30}{100} = 30\%$

30% of 360

$0.30 \times 360 = 108^\circ$




a) List 3 things you know from the graph.

b) What is its advantage and its downfall?

1) Min Max temp

2) Average daily temperature for Plymouth

3) Scale is 1

4) Lowest Min temp was 1°C in feb

b) Double line graph

advantage → Easy to read Max values (highest Peak of line

Downfall → 2 lines to read

"confuse "highest Minimum temp"

c) Continuous Data

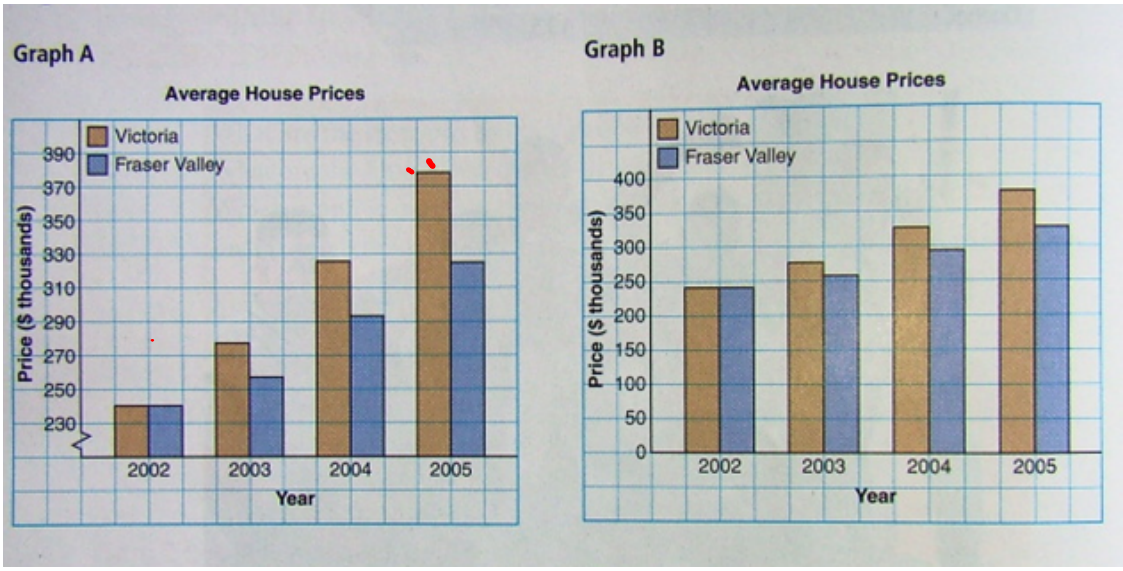
↳ connected

↳ b/c temperature Raise by deci

1°C → 2°C

1.1, 1.2, 1.3, 1.4 . . . 30°

# Misrepresenting Data




What does each graph represent?

The average price of a house in Victoria and Fraser Valley each year from 2002 - 2005

At first glance which graph appears to show the greater difference in house prices? Why?

The graph on the left. There is a greater difference in height for each pair of bars in this graph.

Do the graphs display the same data? Yes

What is the scale of each graph? Graph A → increase by 20
Graph B → increase by 50

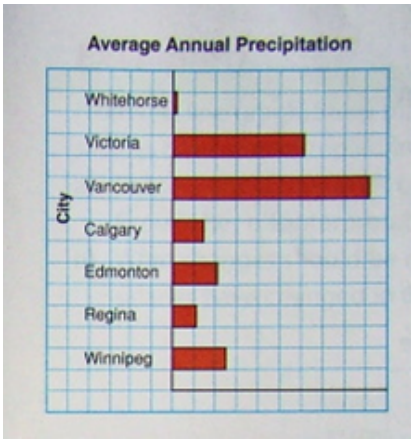
Does the scale on each graph start at zero? No

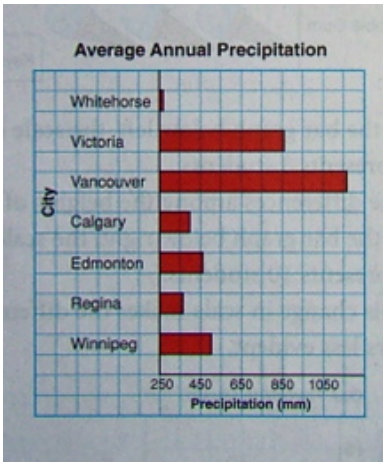
Graph A zoomed in Starts 230
Graph B Starts 0

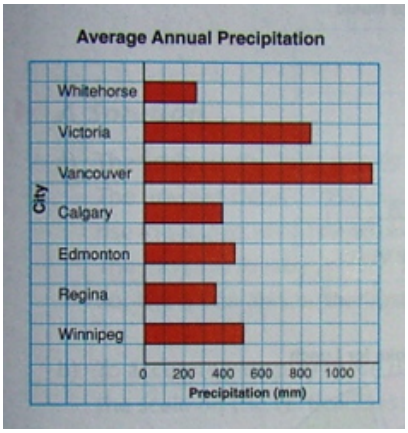
→ Should always start at zero

Is the graph on the left incorrect? Do you think someone who uses this graph to show the difference in houses prices is lying?

No. Both graphs represent the data. However, the graph on the left emphasizes the difference in the average price of a house in Victoria and a house in Fraser Valley.


Average Annual Precipitation
Whitehorse
Victoria
Vancouver
Calgary
Edmonton
Regina
Winnipeg
City

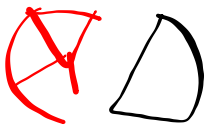

Average Annual Precipitation
Whitehorse
Victoria
Vancouver
Calgary
Edmonton
Regina
Winnipeg
City
250 450 650 850 1050
Precipitation (mm)


Average Annual Precipitation
Whitehorse
Victoria
Vancouver
Calgary
Edmonton
Regina
Winnipeg
City
0 200 400 600 800 1000
Precipitation (mm)

There are many ways in which graphs can be drawn to **misrepresent data**. Graphs like these may be found in the media to create false impressions.

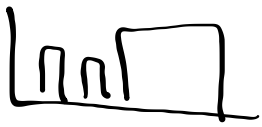
How could a circle graph be misleading?

- Sectors may be treated differently to draw attention to it



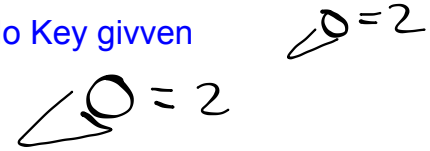
How could a bar graph be misleading?

- Different widths of bars
- No Scale given
- Scale may be too large or too small



How could a pictograph be misleading?

- Different sized symbols
- No Key givven

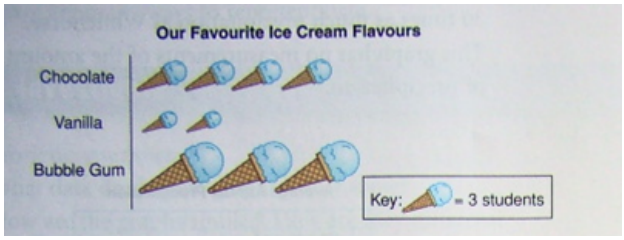


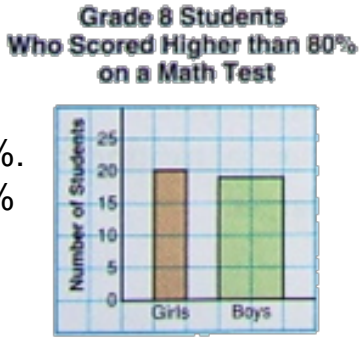

How could a line graph be misleading?

-Distance between points may not be proportional to the length of time between the recorded times.

- No Scale given
- Scale may be too large or too small

In this pictograph, the symbols have different sizes.
The three large ice-cream cone symbols give the impression that bubble gum is the favorite flavour.
When the key is used, chocolate is the favourite flavour.

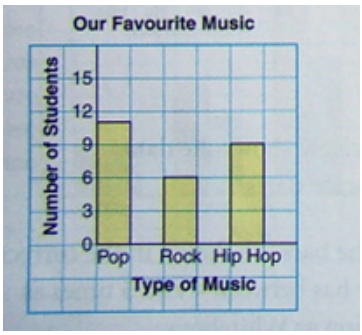


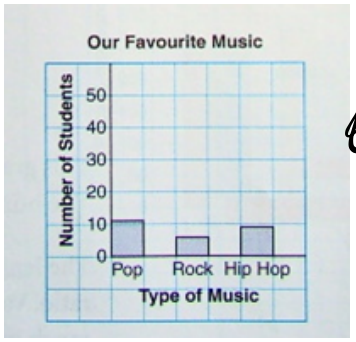




In this bar graph, the wider bar creates the impression that many more boys than girls scored higher than 80%. In fact, the number of girls who scored higher than 80% is greater than the number of boys.

In the bar graph below left, the scale on the vertical axis is 1 square r epresents 3 students. The difference among the heights of the bars are easily seen.

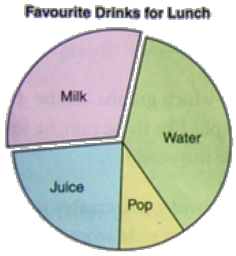
In the graph below right, the scale on the vertical axis is 1 square represents 10 students. This change in scale makes the difference among the heights of the bars less evident.



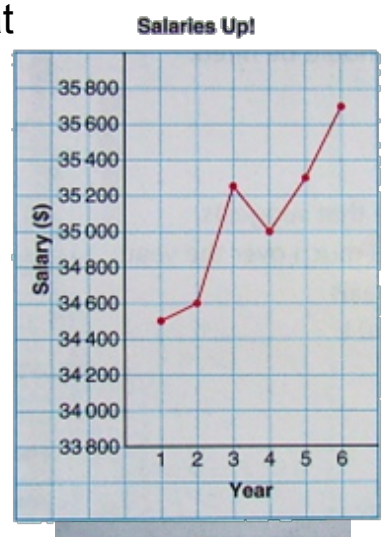




← too small of scale

A part of a graph may be treated differently to draw attention to it.
A milk company uses this circle graph to draw attention to the milk sector.
The sector for milk is not as large as the sector for water, but the special treatment makes it seem larger.



From this line graph, Shiva made the conclusion that salaries have almost tripled in 6 years.




a) Shiva's conclusion is not consistent with the data. Explain her misinterpretation. RANGE???

b) What changes should be made to the graph to accurately show how salaries have changed in 6 years?

# Class/Homework

pg. 387 #2, 3, 5, 6,

Page 399 - 401
#3,#4, #5,

Test Friday
April 15

Monday ????below