0-5 MISLEADING GRAPHS and STATISTICS

S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

MISLEADING GRAPHS - Used to DISTORT **the results of data.**

EXAMPLE 1

The graph shows the size of tomatoes on plants that were treated with different fertilizers.

1. Explain why the graph is misleading.

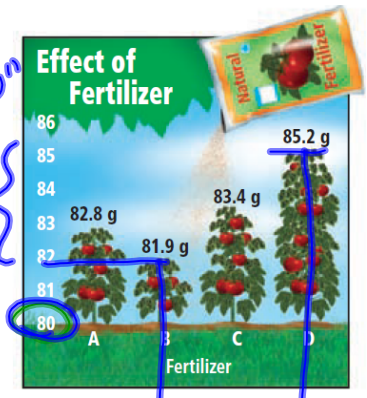
Vertical axis doesn't start at "0"

2. What might someone believe because of the graph?

"B" is half the size of "D"

3. Who might want to use the graph? Explain.

Company "D"



EXAMPLE 2

The graph shows the average price of gasoline in the U.S. in September.

1. Explain why the graph is misleading.

Axis doesn't start at "0"

Vertical Axis is inconsistent

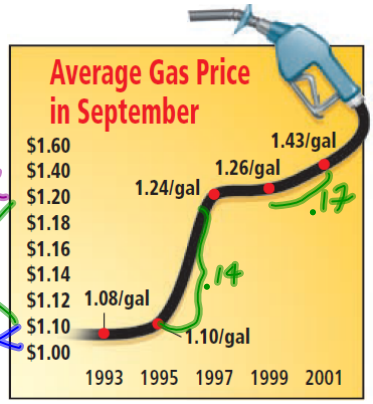
2. What might people be influenced to believe by the graph?

1995 – 1997 was was a huge increase

1999 – 2001 was not a huge increase

3. Who might want to use the graph? Explain.

- Politician
- Large vehicle sales
- Gas company



The graph shows what percent of the total votes were received by three candidates for student council president.

1. Explain why the graph is misleading.

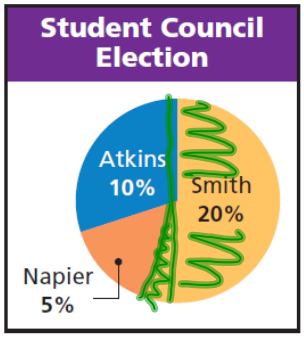
⊙ ≠ 100%.

2. What might people be influenced to believe by the graph?

Smith > 50% of the votes

3. Who might want to use the graph? Explain.

Smith



- Statistics can be misleading because of the way the data is collected or the way the results are reported.
- A sufficiently large RANDOM SAMPLE is a good way to collect unbiased data.
- In a RANDOM SAMPLE, _____ members of the group being surveyed have an _____ chance of being selected.

EXAMPLE 3

A researcher surveys people leaving a basketball game about what they like to watch on TV. Explain why the following statement is misleading:

"80% of people like to watch sports on TV."

biased sample

EXAMPLE 4

A researcher asks 4 people if they have seasonal allergies. Three people respond yes. Explain why the following statement is misleading:

"75% of people have seasonal allergies."

Sample size is too small.