# Communicating with Graphs

# What is a graph?

- A graph is a visual display of information or data.
- Graphs are useful for presenting information in a concise, easily understood manner.

# What are the parts of a graph?

- Title – often, but not always, dependent variable versus independent variable with some description
  - Example – "Boiling Point versus the Concentration of Salt"
- Variable labels with units
  - Labels are along the axes for most types of graphs
  - Example – "Concentration (g/mL)" could be the label for the x-axis

- Scale – each box or piece of the graph must be the same for each axis
  - Example – the x-axis might vary by two units
- Legend – helps explain information shown on the graph
  - Example – Trial 1 may be shown in blue, while Trial 2 is shown in red

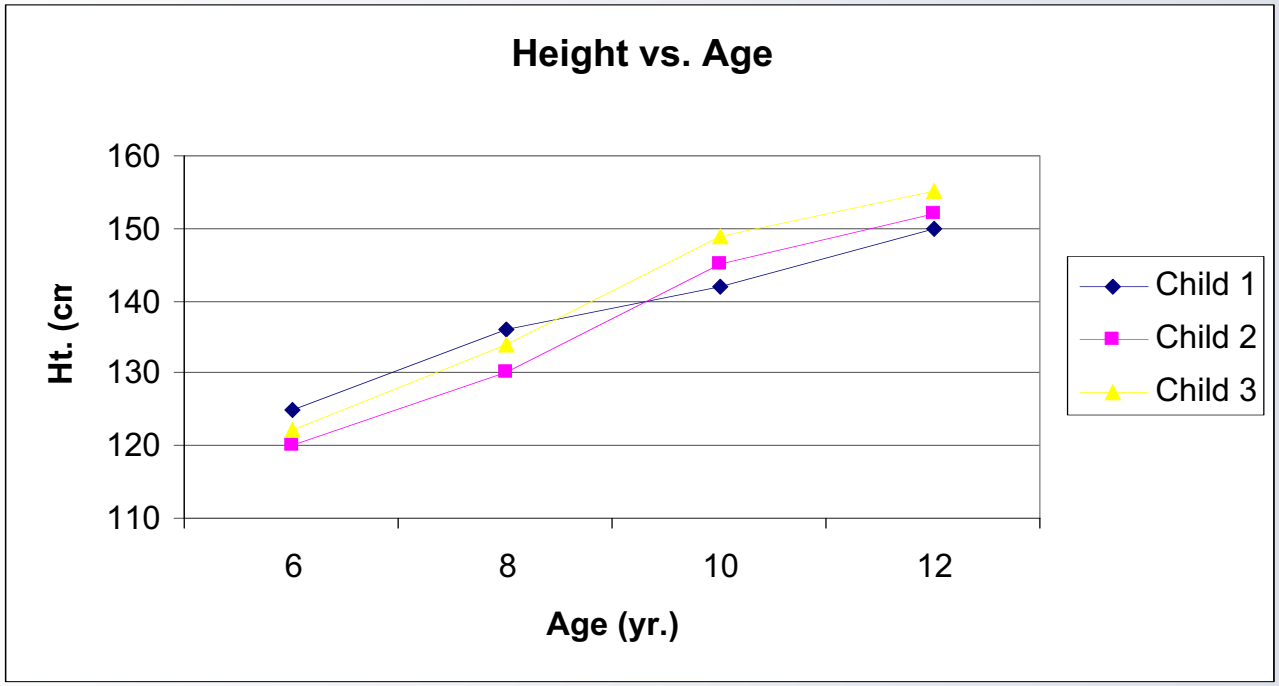
# What are some types of graphs?

- Line Graph
- Bar Graph
- Circle (Pie) Graph
- X-Y Scatter Plot

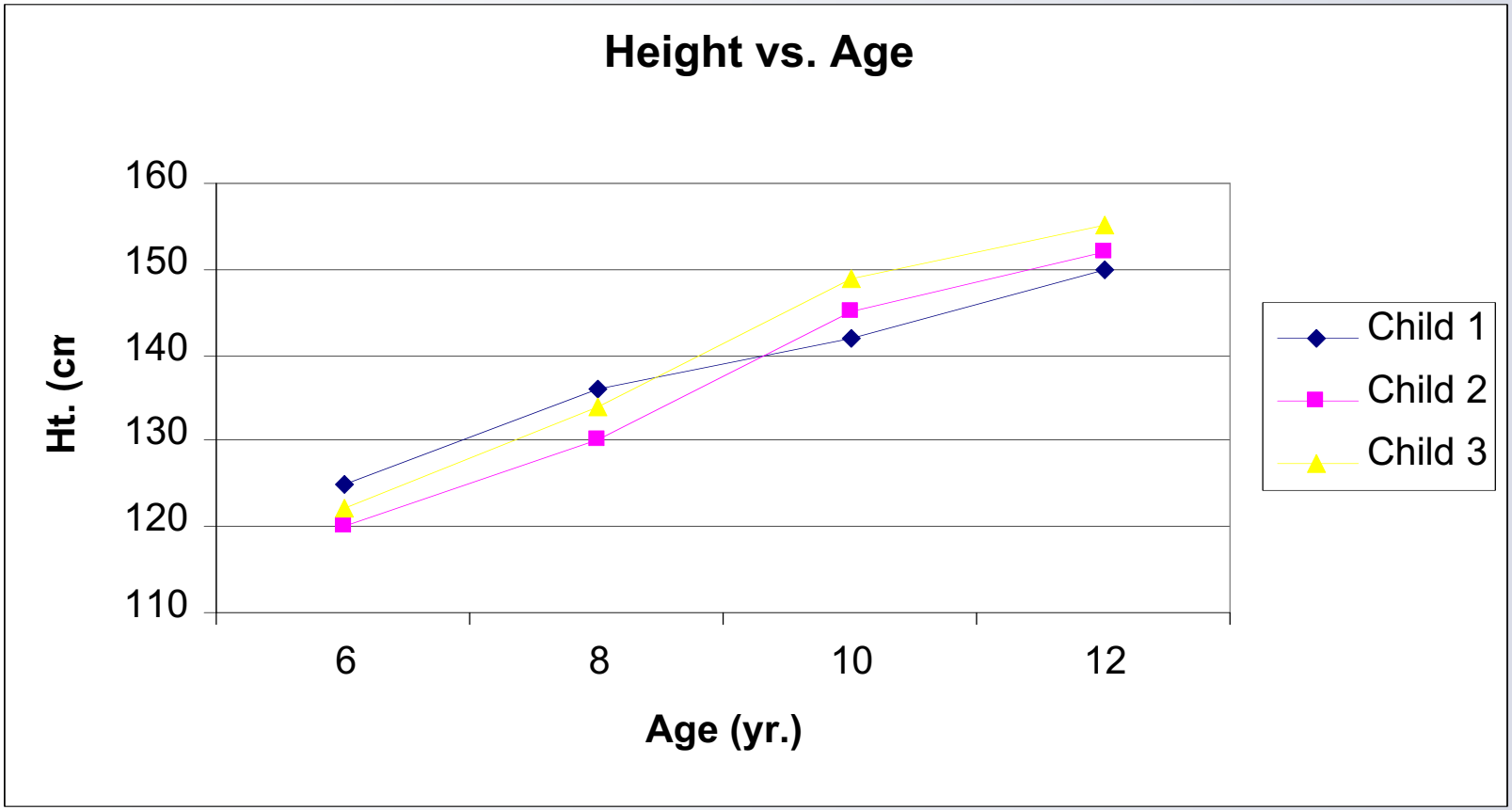
- **Line graphs** show how the dependent variable changes due to some change of the independent variable
  - Has a y vs. x title
  - Can compare more than one trial
  - Useful for comparing the test group with the control
  - Has connected dots

# Sample Line Graph

| Age (yr.) | Height (cm) – Child 1 | Height (cm) – Child 2 | Height (cm) – Child 3 |
|---|---|---|---|
| 6 | 125 | 120 | 122 |
| 8 | 136 | 130 | 134 |
| 10 | 142 | 145 | 149 |
| 12 | 150 | 152 | 155 |



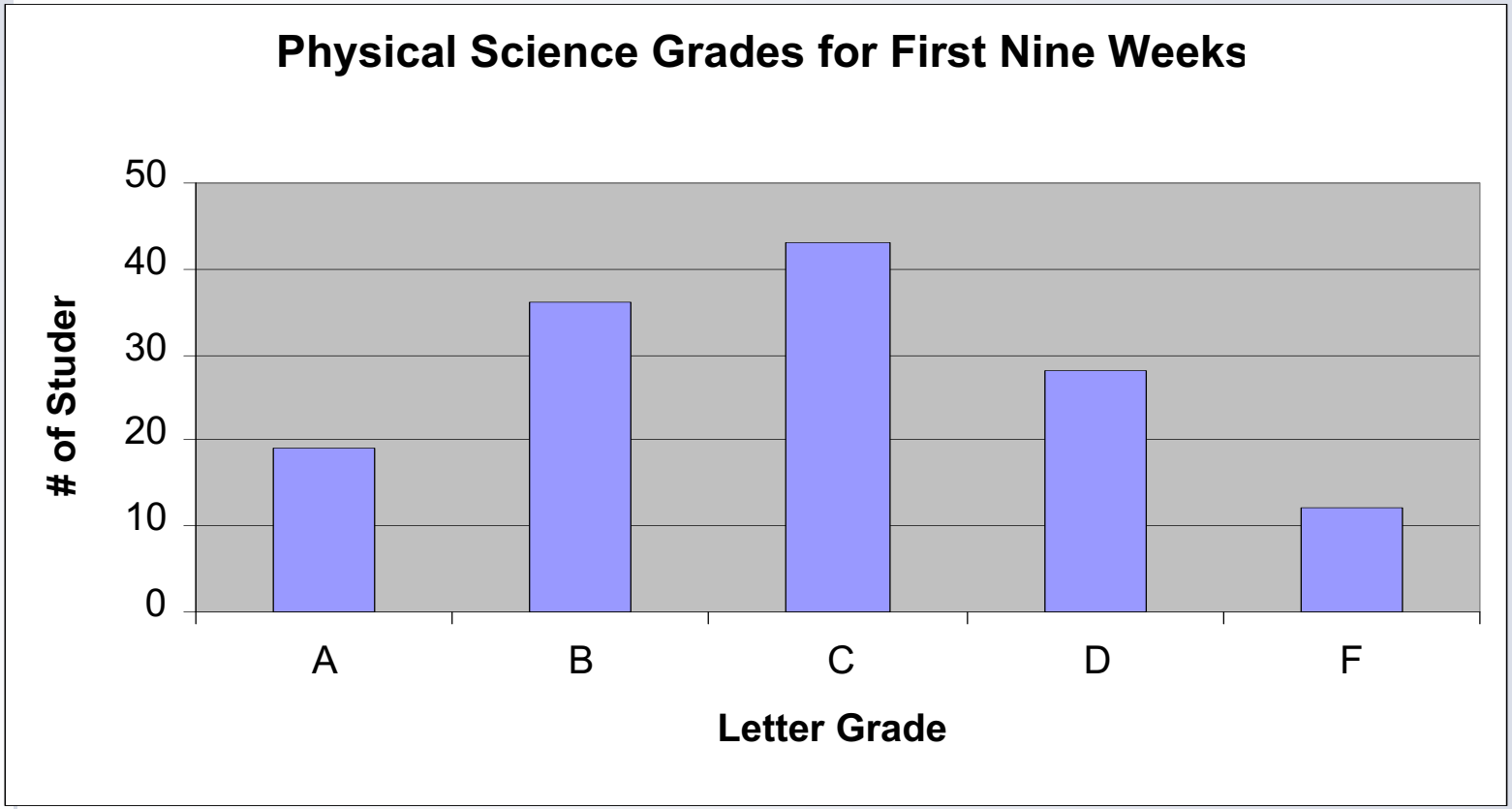
# Reading a Line Graph



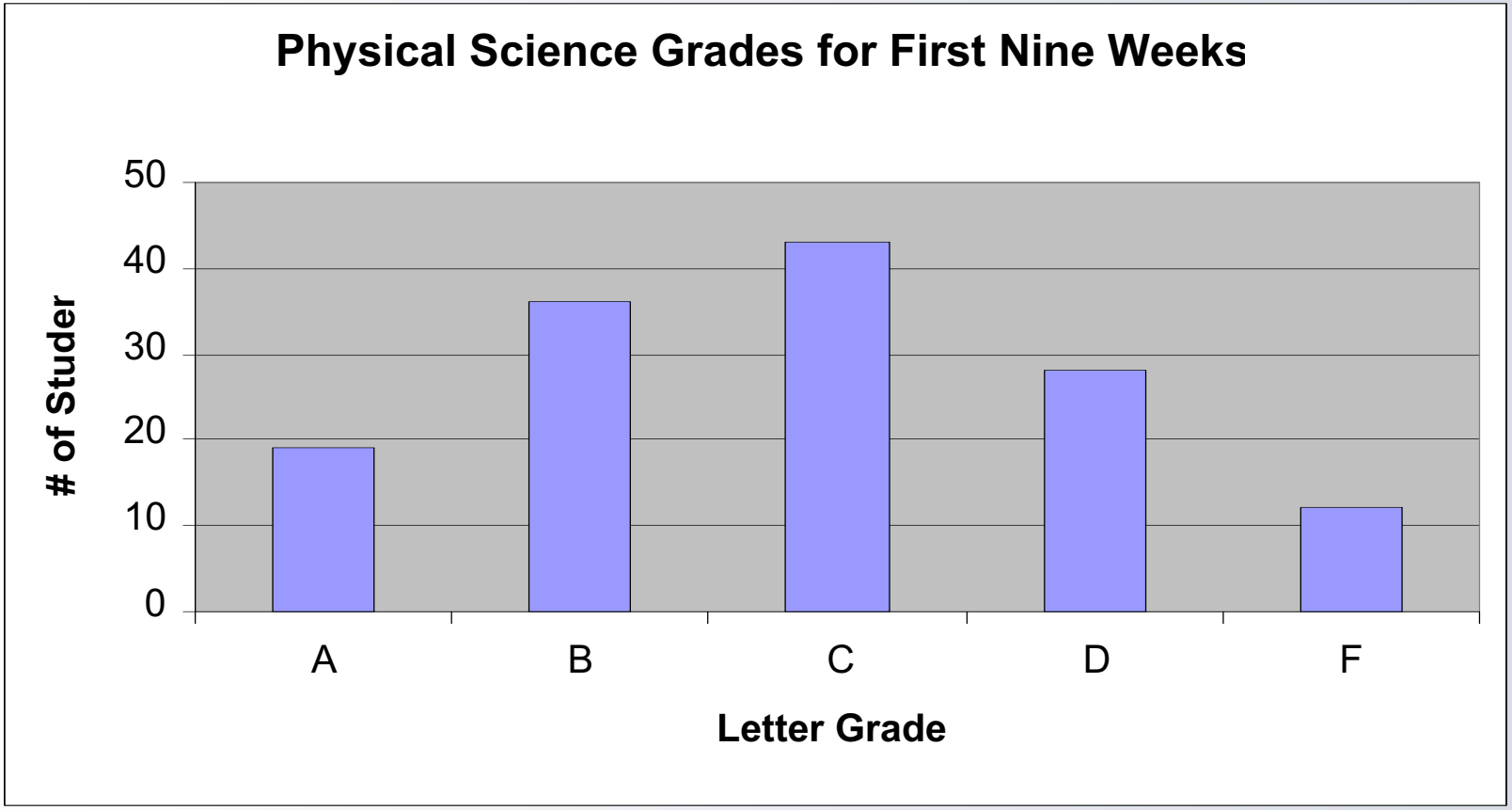
- **Bar graphs** are often used similarly to line graphs.
  - Can be used to express data obtained through counting
  - Often has a y vs. x title

# Sample Bar Graph

| Letter Grade | A | B | C | D | F |
|---|---|---|---|---|---|
| # of Students | 19 | 36 | 43 | 28 | 12 |



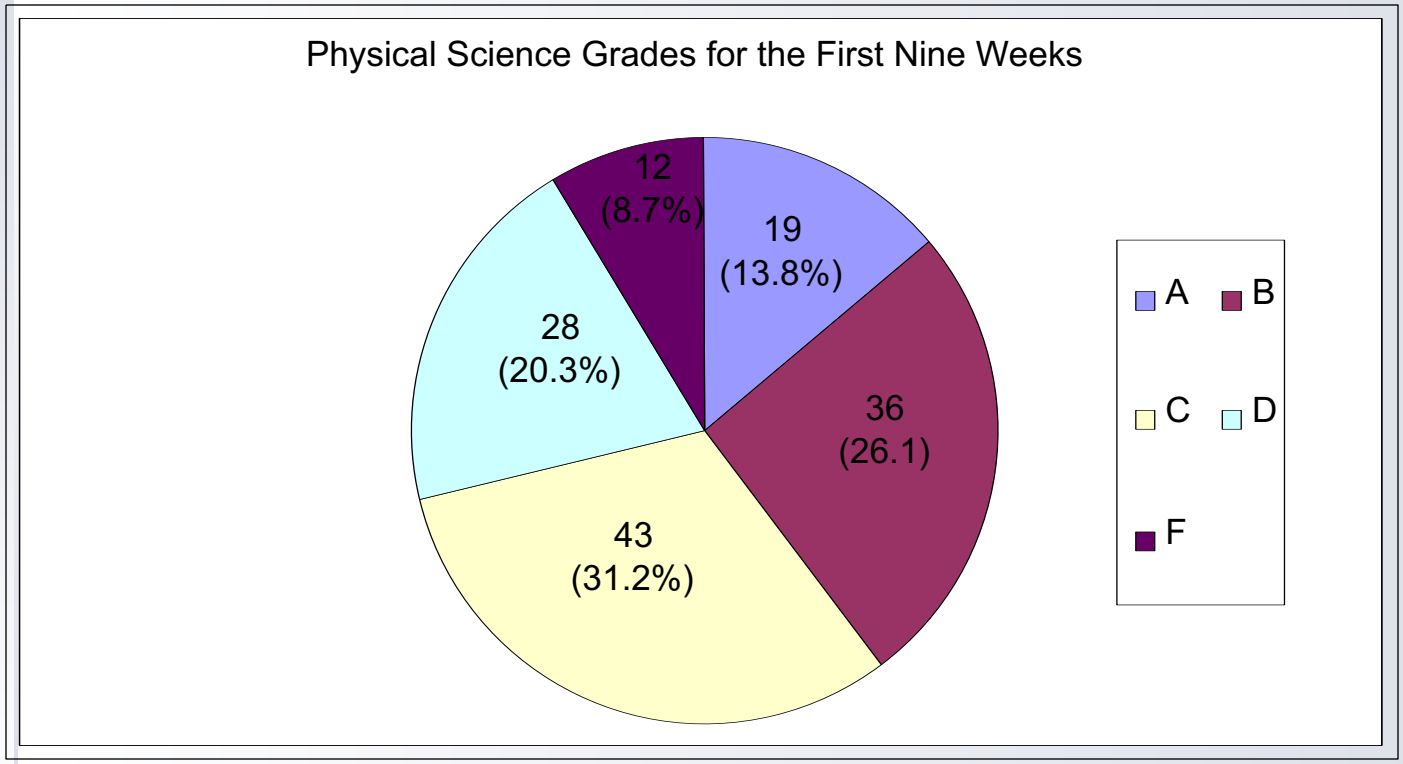
# Reading a Bar Graph



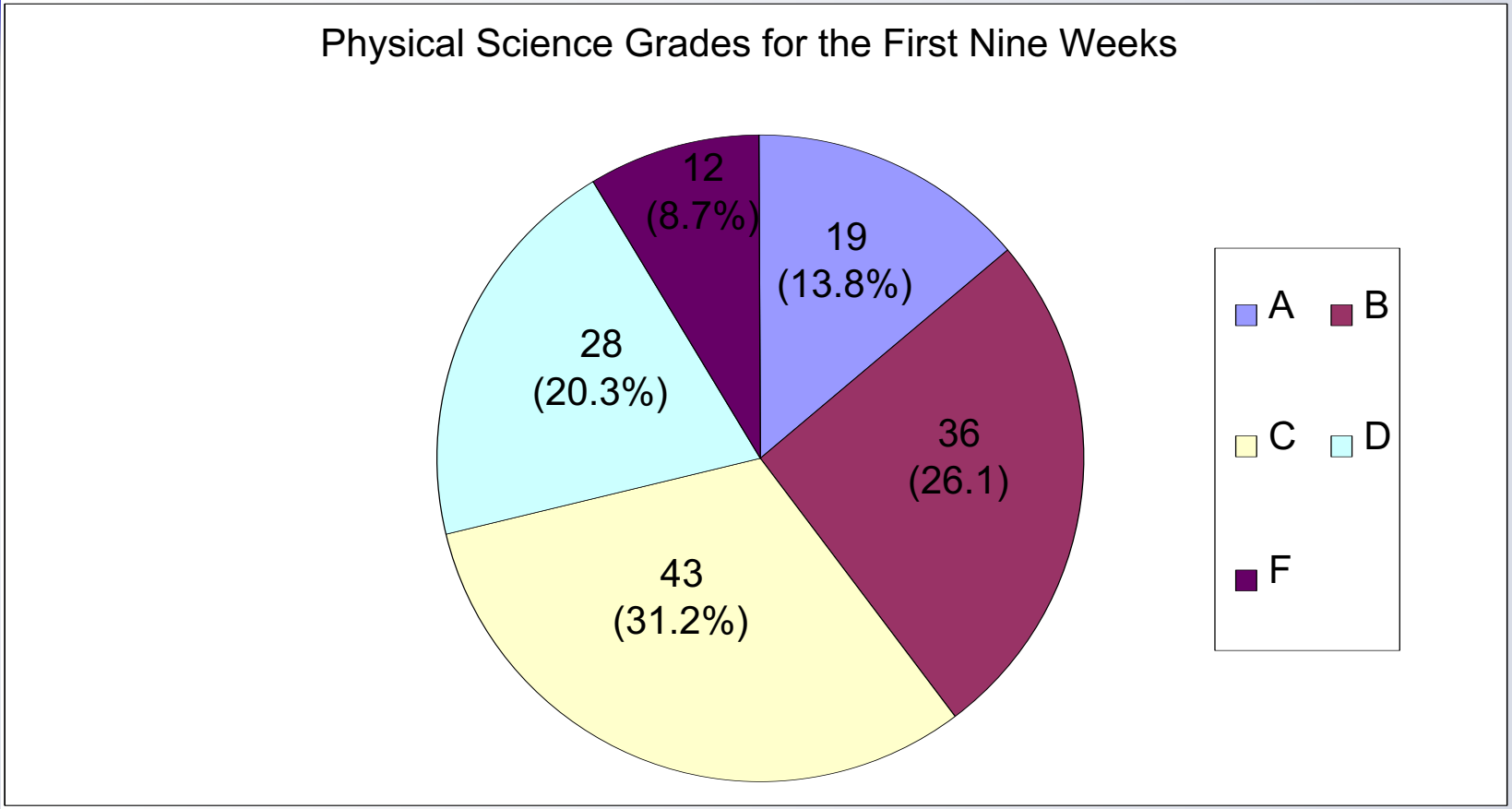
- **<u>Circle graphs (pie graphs)</u>** are used to show how a fixed quantity is broken into parts. Circle graphs often represent percentages.
  - The circle or pie represents the total
  - The slices represent the parts

# Sample Circle Graph

| Letter Grade | A | B | C | D | F |
|---|---|---|---|---|---|
| # of Students | 19 | 36 | 43 | 28 | 12 |



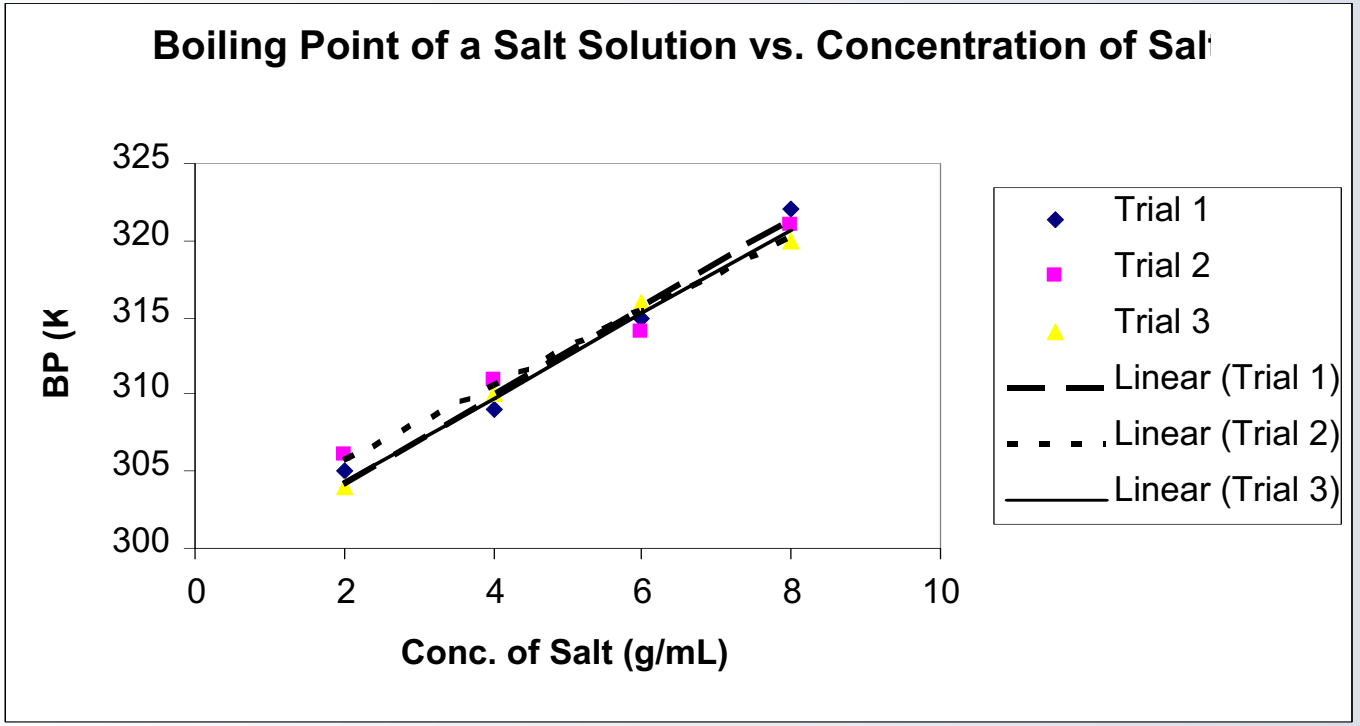
# Reading a Circle Graph



- X-Y scatter plots are used to represent data that has a linear relationship.
  - Data tables consist of x and y values, generally in columns
  - Plot ordered pairs (x,y)
  - Do not connect dots
  - Draw a “best-fit” line with the formula y=mx+b

# Sample Scatter Plot

| Conc. of Salt (g/mL) | Trial 1 BP (K) | Trial 2 BP (K) | Trial 3 BP (K) |
|---|---|---|---|
| 2 | 305 | 306 | 304 |
| 4 | 309 | 311 | 310 |
| 6 | 315 | 314 | 316 |
| 8 | 322 | 321 | 320 |



# Reading an X-Y Scatter Plot