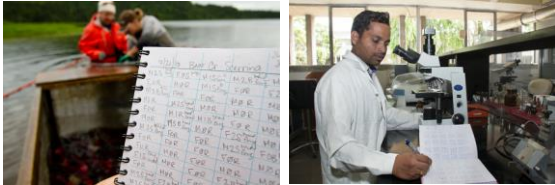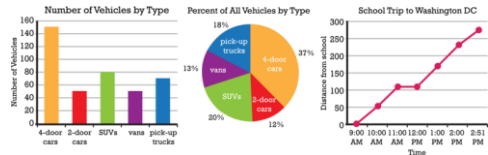# How do Scientists Organize Data?

Data Tables and Graphs

- Visually organize data

- Allows you to quickly and easily observe <u>trends</u>

Which Drink Do You Like Best?
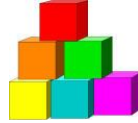
Coke   Water   Iced Tea

Pepsi   Gatorade

How Can We Organize this Data?

- <u>Group</u> common answers

Grouping

How Can We Organize this Data?

- <u>Group</u> common answers

- Make a <u>table</u> of data

Grouping

How Can We Organize this Data?

- <u>Group</u> common answers

- Make a <u>table</u> of data

Grouping

Drink	Number
Coke	
Pepsi	
Water	
Iced tea	
Gatorade	

By Drink

How Can We Organize this Data?

- <u>Group</u> common answers

- Make a <u>table</u> of data

Grouping

Table

Drink	Number
Coke	
Pepsi	
Water	
Iced tea	
Gatorade	

By Drink

How Can We Organize this Data?

- Choose a <u>graph</u> type to display your data.

Bar Graph
Ave. Life Span of Animals

Life span in years
70 60 50 40 30 20 10

Fox Mouse Pig Chimp Donkey
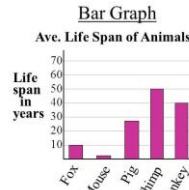
-Used to compare quantities

Line Graph
Daytime Temperature

Temp. °F
90 80 70 60 50 40 30

4am 6am 8am 10am 12am 2pm
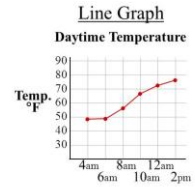
-Used to show change over time

Which Drink Do You Like Best?

Bar Graph

number of students

6
5
4
3
2
1
0

Coke Pepsi Water Tea Gatorade

type of drink

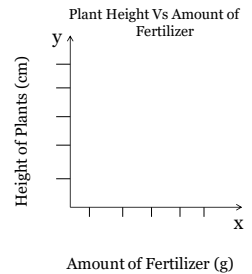| Drink	Number
Coke	1
Pepsi	1
Water	4
Iced tea	4
Gatorade	3
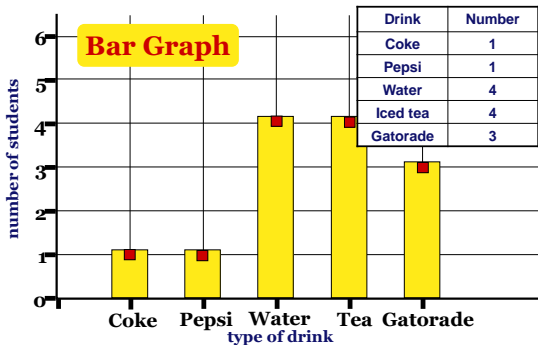
Rules for Line Graphs

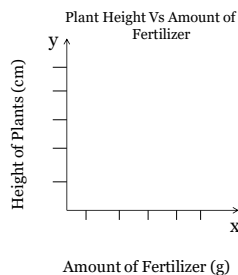1. Title your graph – <u>Dependent vs Independent</u>

2. Label x-axis and y-axis
   - Independent Variable goes on <u>x-axis</u> (horizontal)
   - Dependent goes on the <u>y axis</u> (vertical)
   - Be sure to include units

Plant Height Vs Amount of Fertilizer

y

Height of Plants (cm)

x

Amount of Fertilizer (g)

Rules for Line Graphs
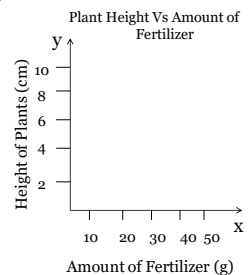
3. Make a constant scale
   - In science, scales <u>do not</u> have to start with 0.

   - Scales can also be <u>different</u> for each axis.

   - Spread out the data as much as the paper allows.

Plant Height Vs Amount of Fertilizer

y

Height of Plants (cm)

x

Amount of Fertilizer (g)

Rules for Line Graphs

3. Make a constant scale
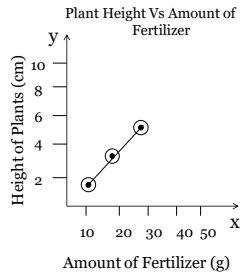   - Refer to the data table and find the <u>range</u> of numbers (largest - smallest)
   - Count the number of boxes
   - <u>Range</u> = Scale
   Number of Boxes

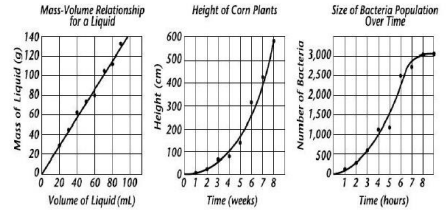   - Best scales are whole number multiples (1, 2, 5, 10)

Plant Height Vs Amount of Fertilizer

y

Height of Plants (cm)

10
8
6
4
2

x

10 20 30 40 50

Amount of Fertilizer (g)

Rules for Line Graphs

4. Plot your data points, using a dot surrounded by a larger circle.

5. Connect the dots using a <u>line of best fit</u>.

Plant Height Vs Amount of Fertilizer

Height of Plants (cm)

Amount of Fertilizer (g)

Line of best Fit

Line of best fit emphasizes the overall trend shown by all the data taken as a whole

Mass-Volume Relationship for a Liquid — Height of Corn Plants — Size of Bacteria Population Over Time

---

Rules for Line Graphs

6. If multiple sets of data exist, use a different <u>color</u> or shape to indicate the difference.
   ➢ Also add a <u>legend</u>.

Exponential growth and decay