

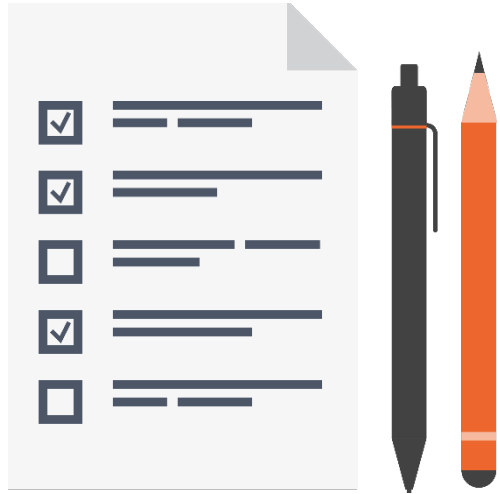
# Visualizing Data in Charts



Ben Sullins

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# Module Goals



What is Data Visualization?

Why Visualize Data?

How Data Visualization Works

Key Concepts

Where to Find More

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# What Is Data Visualization?

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Data Visualization is the process of displaying information to more easily understand the underlying meaning.



Today JUNE 30

Last Sync: 51 mins ago

Today



11,080 steps



2,685 cals



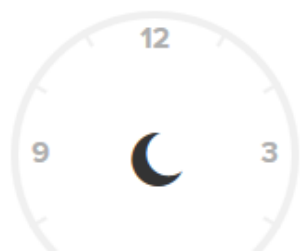
5.87 miles



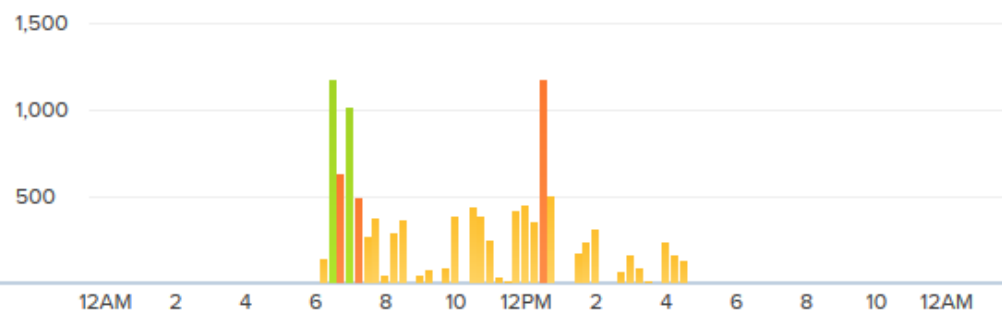
44 active mins



19 floors



Steps



Daily



7-Day Average

12,016 steps

Beat Yesterday

4,004 steps to go

Lifetime Steps

377,503 steps

Friends

		1
	143,902	
		2
	136,500	
		3
	84,553	
		4
	80,021	
		5
	65,199	
		6
	58,754	

Recent Exercise

Weights

Jun 30 >

50 minutes

432 cals

116 bpm avg



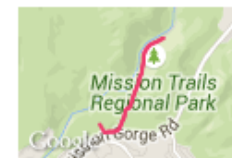
Hike

Jun 29 >

2.79 miles

25'19" pace

100 bpm avg



Weights

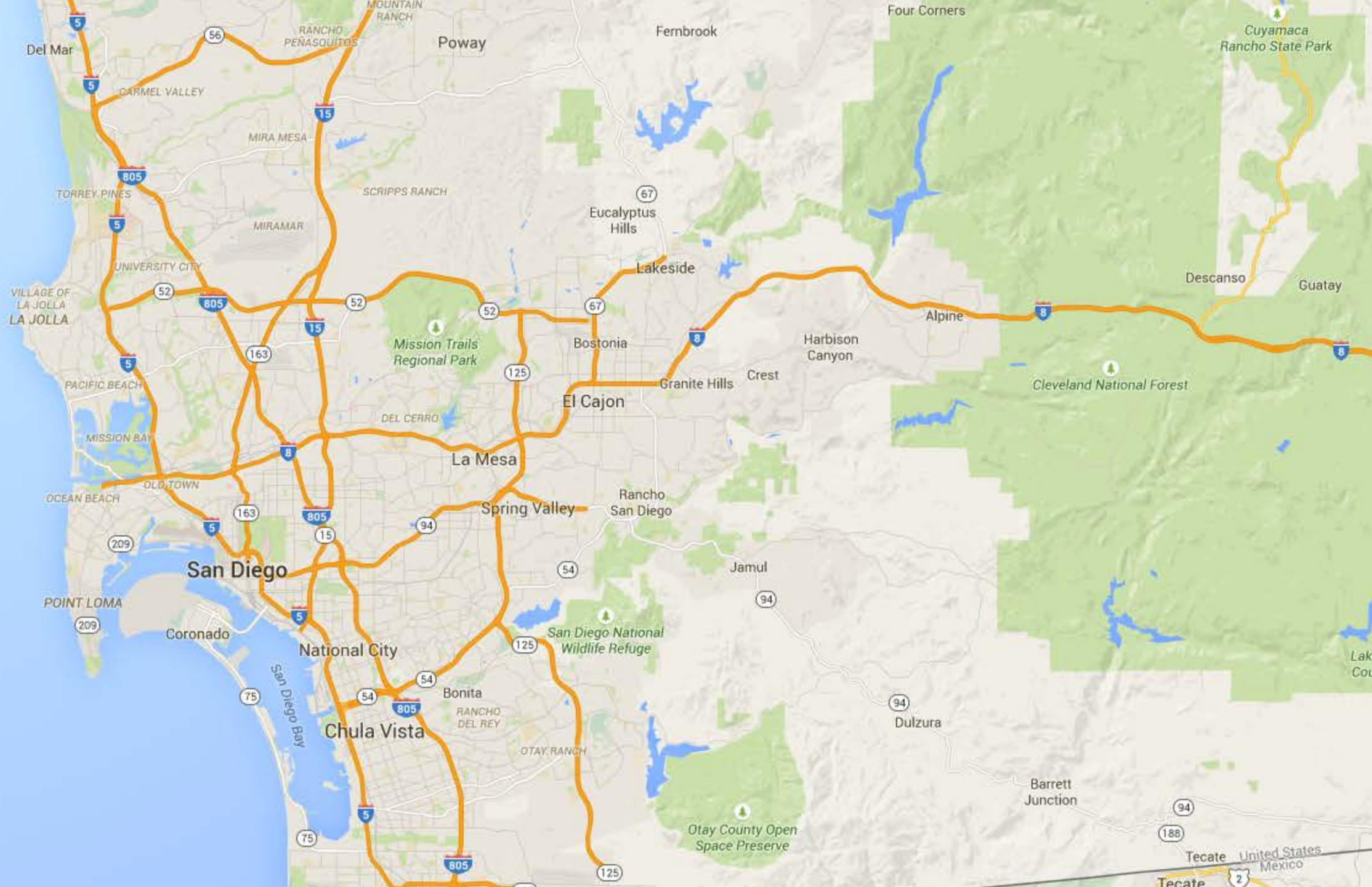
Jun 29 >



64 bpm

resting heart rate





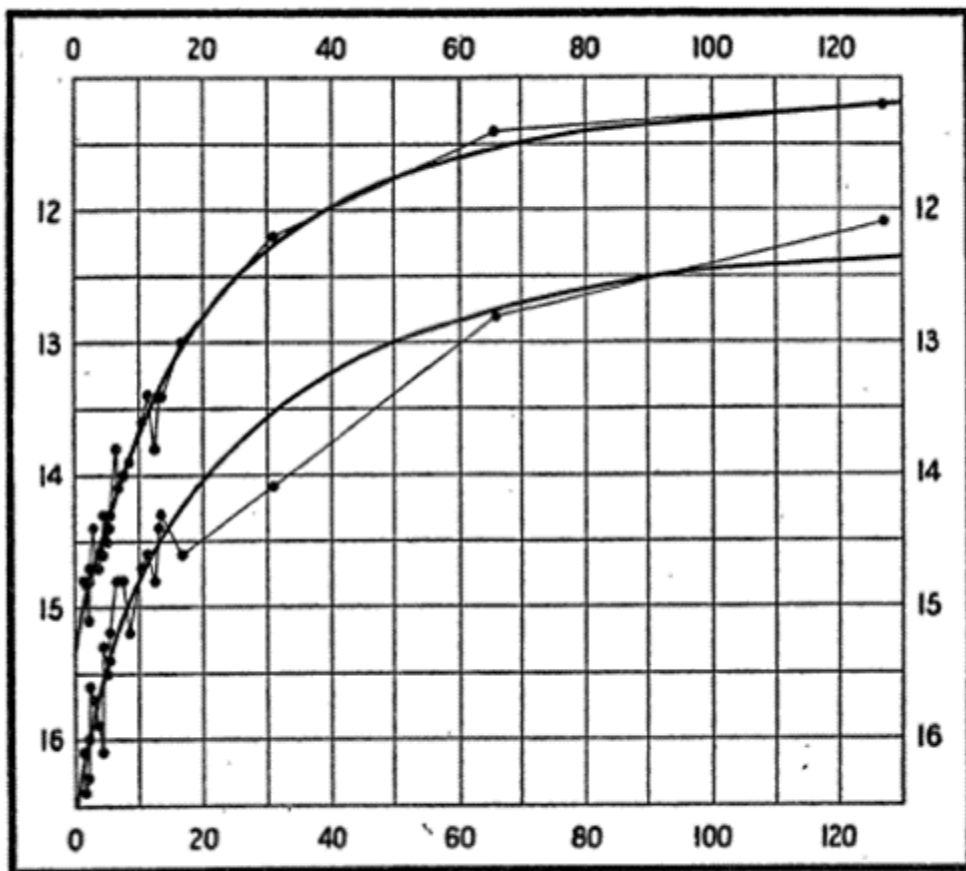


FIG. 1.

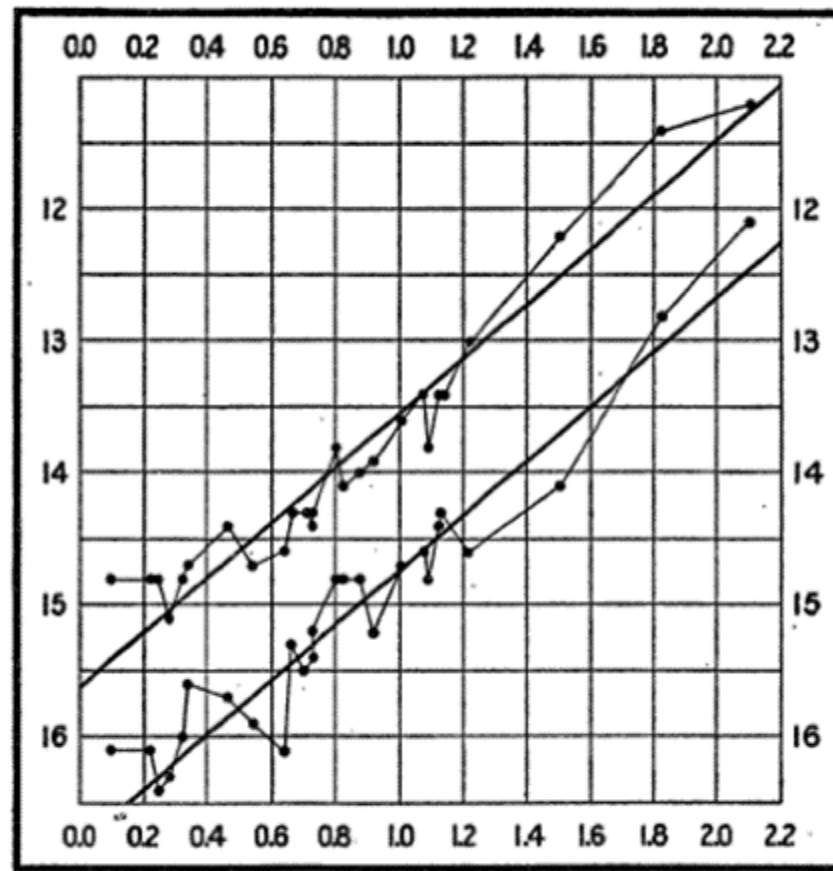


FIG. 2.

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# Why Visualize Data?

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Humans process visual input above all else and faster than any other method. This is the key reason for visualizing data.

## Data

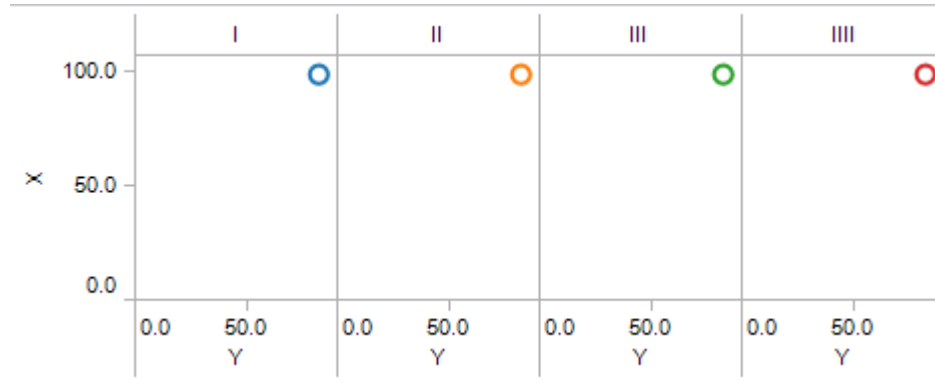
I		II		III		IV	
x	y	x	y	x	y	x	y
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

## Stats

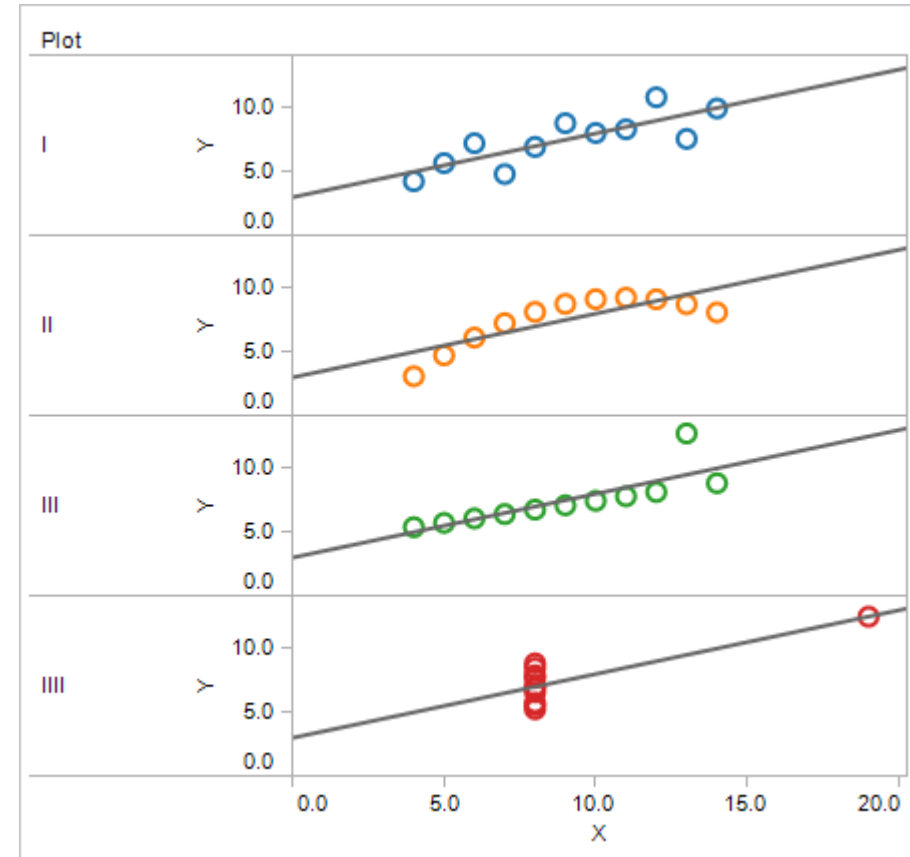
Property	Value
Mean of $x$ in each case	9 (exact)
Variance of $x$ in each case	11 (exact)
Mean of $y$ in each case	7.50 (to 2 decimal places)
Variance of $y$ in each case	4.122 or 4.127 (to 3 decimal places)
Correlation between $x$ and $y$ in each case	0.816 (to 3 decimal places)
Linear regression line in each case	$y = 3.00 + 0.500x$ (to 2 and 3 decimal places, respectively)

# Anscombe's Quartet

## Stats Visualized



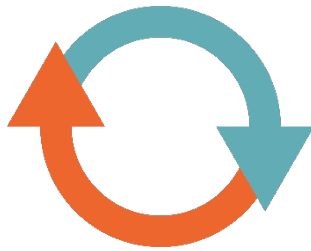
## Data Visualized



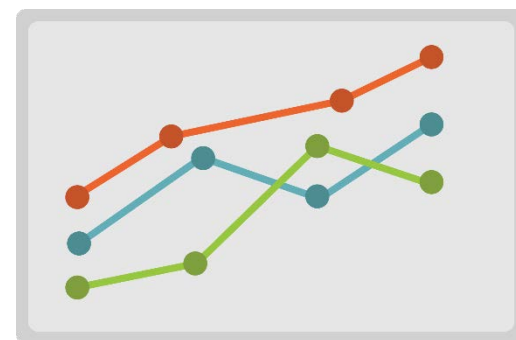
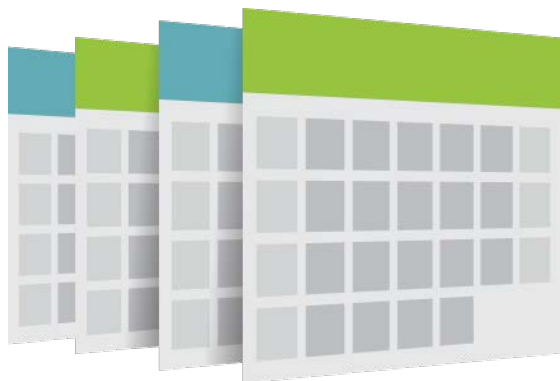
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# How Data Visualization Works

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By plotting data points on charts and graphs, now typically done with software, data takes shape for your eyes to consume.



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# Key Concept: Visual Perception

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# Count how many times the number 5 appears

```
987349790275647902894728624092406037070570279072  
803208029007302501270237008374082078720272007083  
247802602703793775709707377970667462097094702780  
927979709723097230979592750927279798734972608027
```



# Now try...

98734979027**5**647902894728624092406037070**5**70279072  
803208029007302**5**01270237008374082078720272007083  
24780260270379377**5**709707377970667462097094702780  
927979709723097230979**5**927**5**0927279798734972608027

# Attentive

987349790275647902894728624092406037070570279072  
803208029007302501270237008374082078720272007083  
247802602703793775709707377970667462097094702780  
927979709723097230979592750927279798734972608027

# Pre-Attentive

98734979027**5**647902894728624092406037070**5**70279072  
803208029007302**5**01270237008374082078720272007083  
24780260270379377**5**709707377970667462097094702780  
927979709723097230979**5**927**5**0927279798734972608027

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# Key Concept: Color

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# Color in Nature



**Golden Dart Frog**

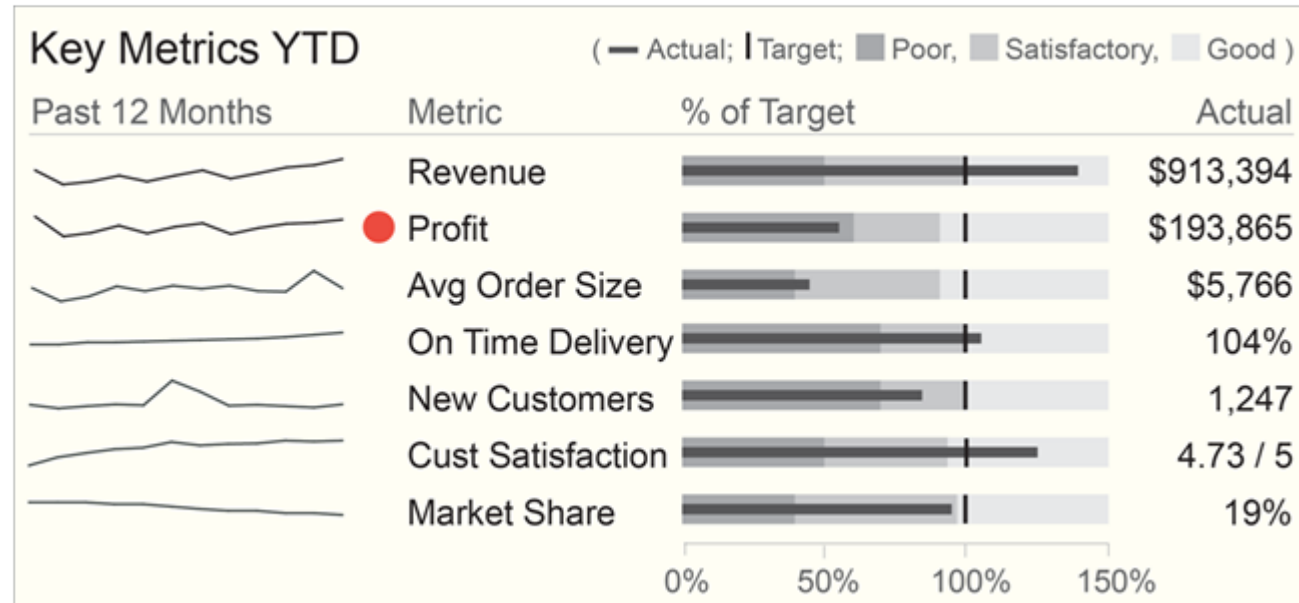
*2 micrograms can kill an adult human*



**Hala Fruit**

*Sweet fruit*

# Good Use of Color



# Poor Use of Color

Product Category	Product Sub-Category	Profit Ratio	
Furniture	Bookcases	-1.5%	◆
	Chairs & Chairmats	14.2%	▲
	Office Furnishings	20.7%	▲
	Tables	-6.8%	◆
Office Supplies	Appliances	26.6%	▲
	Binders and Binder Accessori..	35.5%	▲
	Envelopes	31.2%	▲
	Labels	75.8%	●
	Paper	13.9%	▲
	Pens & Art Supplies	1.2%	▲
	Rubber Bands	-32.8%	◆
	Scissors, Rulers and Trimmers	-4.8%	◆
	Storage & Organization	1.4%	▲
Technology	Computer Peripherals	17.9%	▲
	Copiers and Fax	19.5%	▲
	Office Machines	13.8%	▲
	Telephones and Communicati..	26.0%	▲

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# Key Concept: Chart Types

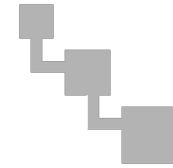
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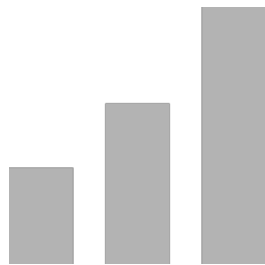
**Geo-Spatial**



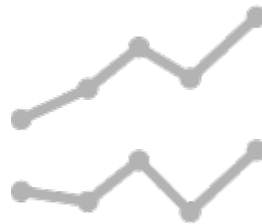
**Correlation**



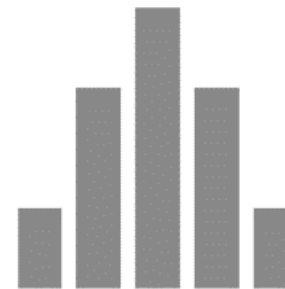
**Hierarchical**



**Categorical**



**Time Series**



**Distribution**

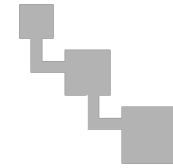




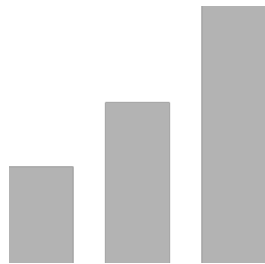
**Maps**



**Scatterplot**



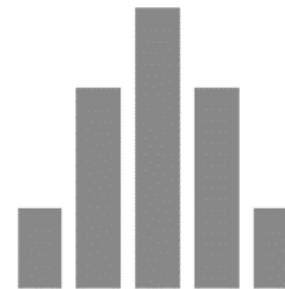
**Drill-Down**



**Bar**



**Line**



**Histogram**

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# Key Concept: Dashboards

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# Where to Find More

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# Additional Resources



## Pluralsight Courses:

- **Business Dashboard Fundamentals**
- **Data Visualization for Developers**
- **D3.js Data Visualization Fundamentals**

## Books:

- **Information Dashboard Design v1 (Stephen Few)**