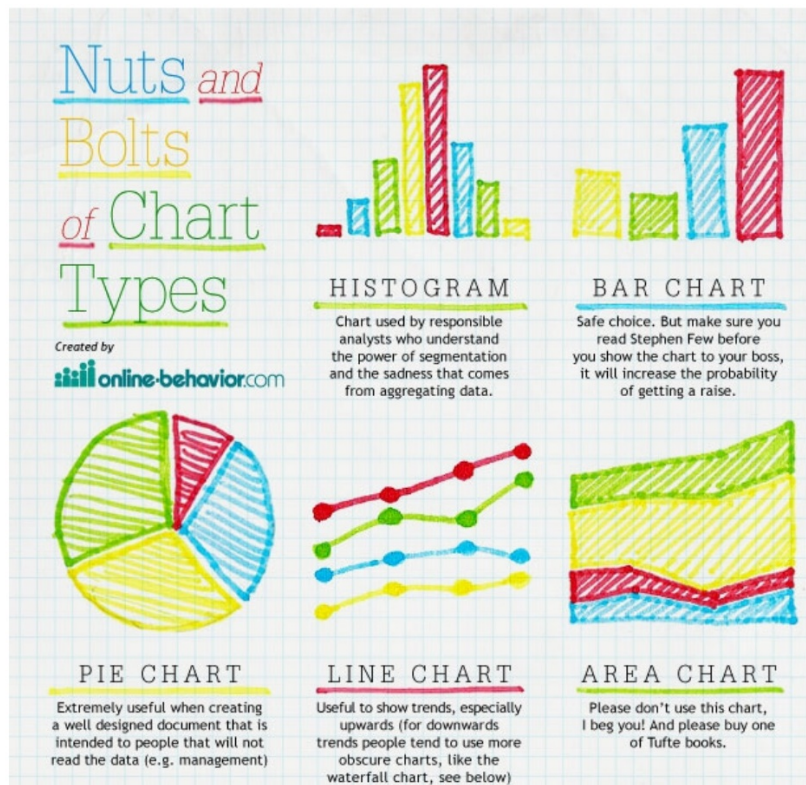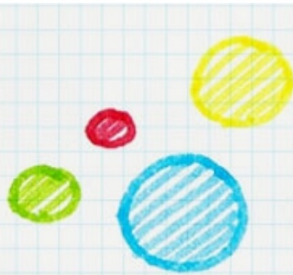# Lesson Overview
Introduction to Data Analysis

Objective: The student will be able to design an appropriate graph for a given experiment.

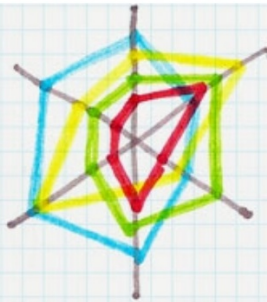# Data Analysis

Discuss the importance of data.

Nuts *and* Bolts *of* Chart Types

Created by
online-behavior.com

HISTOGRAM
Chart used by responsible analysts who understand the power of segmentation and the sadness that comes from aggregating data.

BAR CHART
Safe choice. But make sure you read Stephen Few before you show the chart to your boss, it will increase the probability of getting a raise.

PIE CHART
Extremely useful when creating a well designed document that is intended to people that will not read the data (e.g. management)

LINE CHART
Useful to show trends, especially upwards (for downwards trends people tend to use more obscure charts, like the waterfall chart, see below)

AREA CHART
Please don't use this chart, I beg you! And please buy one of Tufte books.
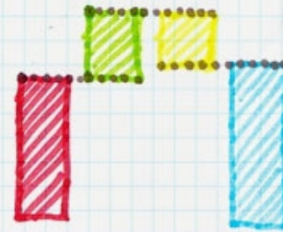
BUBBLE CHART

If you manage to extract insights from this graph your name is Hans Rosling.
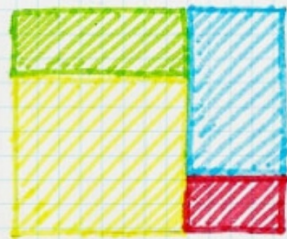
RADAR CHART

If you want to build a complex model around which you have done a ton of research, that's your choice (but only PhDs will understand you).
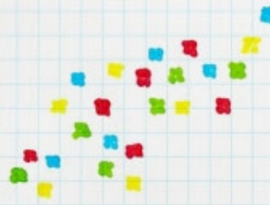
WATERFALL CHART

Perfect if you want to hide information or misguide other people. Seriously, can you trust a chart that is also known as a "Flying Bricks Chart" or "Mario Chart"? No.
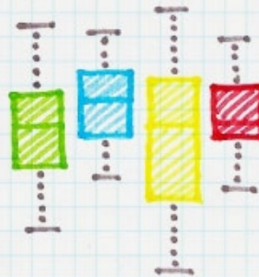
TREE MAP

I have seen trees and I have seen maps, but how exactly this map is a combination of both? If you use it, good for you.

SCATTERPLOT

Very useful to find outliers, just like the people that commonly create them: human beings that finished their PhD in math by the age of 16.
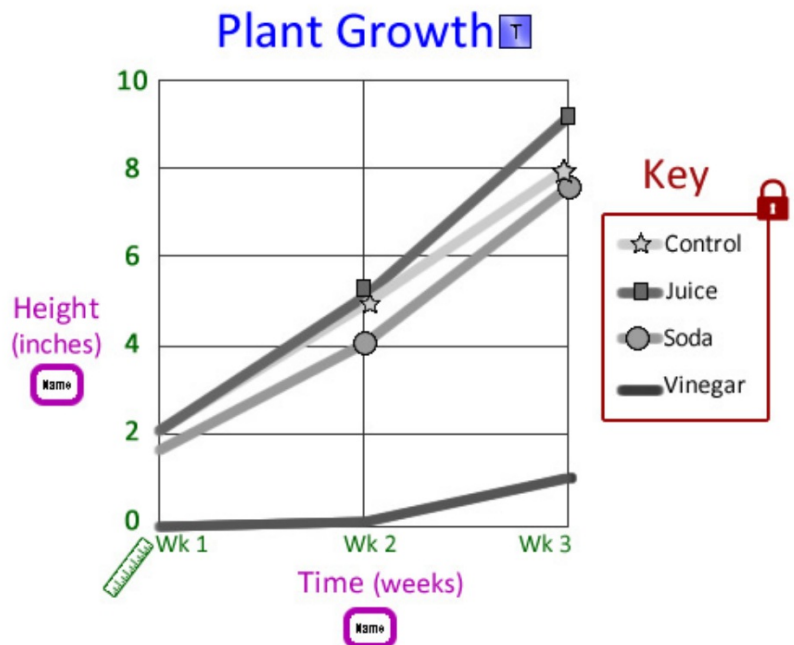
BOX PLOT

This one is for pros. If you use it successfully, you will get a seat in heaven between Ronald Fisher and Johann Carl Friedrich Gauss.

Creating a Winning Graph

Every graph needs:

Title
Describe your graph

Labels
Tells the types of data displayed

Scale
Shows units of measurement

Key
Identifies what symbols stand for

Plant Growth

Height (inches)

Time (weeks)

Wk 1   Wk 2   Wk 3

Key

☆ Control
■ Juice
● Soda
— Vinegar

Sample Problem:
Data Analysis

The grades of a class were graphed as a pie chart. Based on this chart:

(a) The largest percentage of students received what grade? _____

(b) The smallest percentage of students received what grade? _____

(c) Estimate what percentage of the class received a B. _____

(d) Based on the graph, do you think this class is hard?
Explain below. (i.e. Why or why not?)