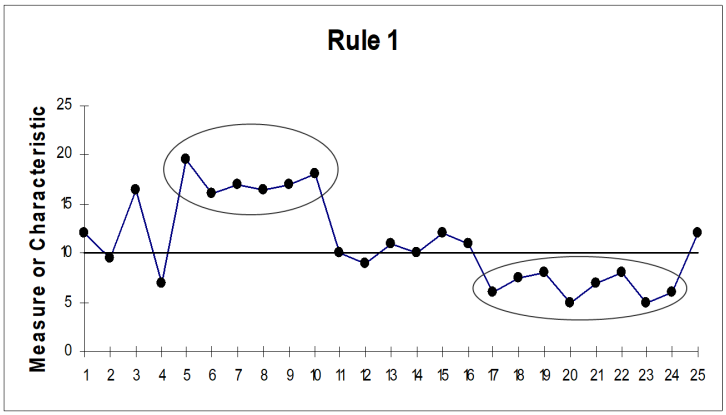
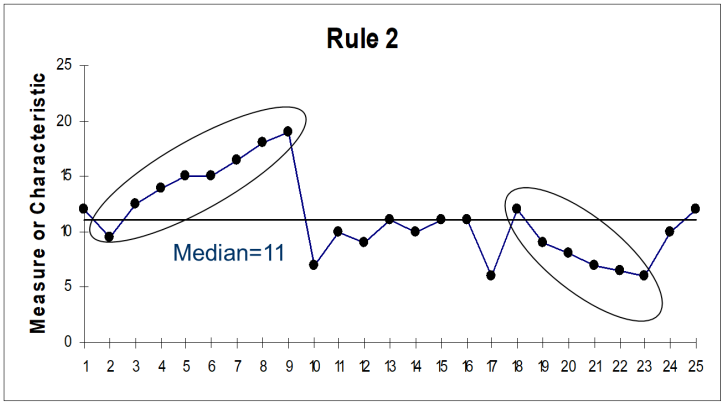
Carnegie Foundation for the Advancement of Teaching

Rule for Run Chart Interpretation



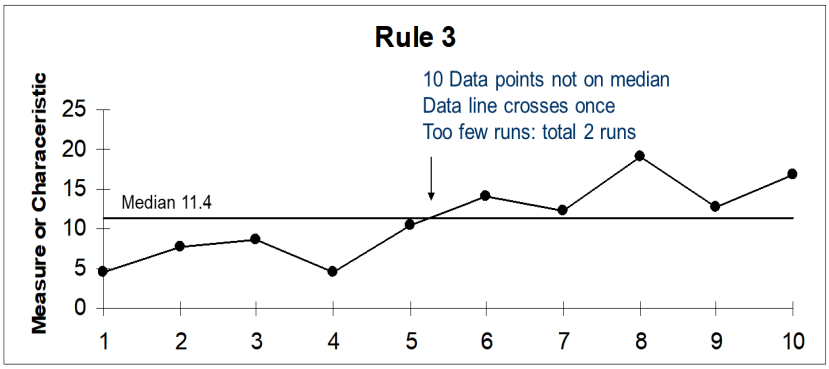
Murray and Provost

Rule 1 (Shift): Six or more consecutive POINTS either all above or all below the median. Skip values on the median and continue counting points. Values on the median DO NOT make or break a shift.



Murray and Provost

Rule 2 (Trend): Five points all going up or all going down. If the value of two or more successive points is the same, ignore one of the points when counting; like values do not make or break a trend.



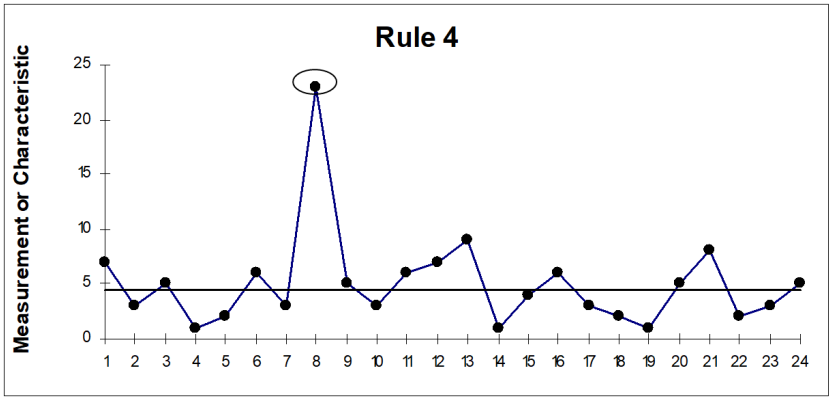
Murray and Provost

Rule 3 (Too many or too few runs) To Determine the number of runs above and below the median: A run is a series of points in a row on one side of the median. Some points fall right on the median, which makes it hard to decide which run these points belong to. So, an easy way to determine the number of runs is to count the number of times the data line crosses the median and add one. Non-random change signaled by too few or too many runs.

Table for Checking for Too Many or Too Few Runs on a Run Chart

Total number of data points on the run chart *that do not fall on the median*	Lower limit for the number of runs (< than this number of runs is "too few")	Upper limit for the number of runs (> than this number of runs is "too many")
10	3	9
11	3	10
12	3	11
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16
21	7	16
22	7	17
23	7	17
24	8	18
25	8	18

Table is based on about a 5% risk of failing the run test for random patterns of data.
Adapted from Swed, Feda S. and Eisenhart, C. (1943). "Tables for Testing Randomness of Grouping in a Sequence of Alternatives. Annals of Mathematical Statistics. Vol. XIV, pp.66 and 87, Tables II and III.



Murray and Provost

Rule 4 (Astronomical value): For detecting unusually large or small numbers. Data that is blatantly obviously different in value from other data points. Everyone studying the chart agrees that it is unusual. Remember, every data set will have a high and a low. This does not mean the high or low are astronomical.

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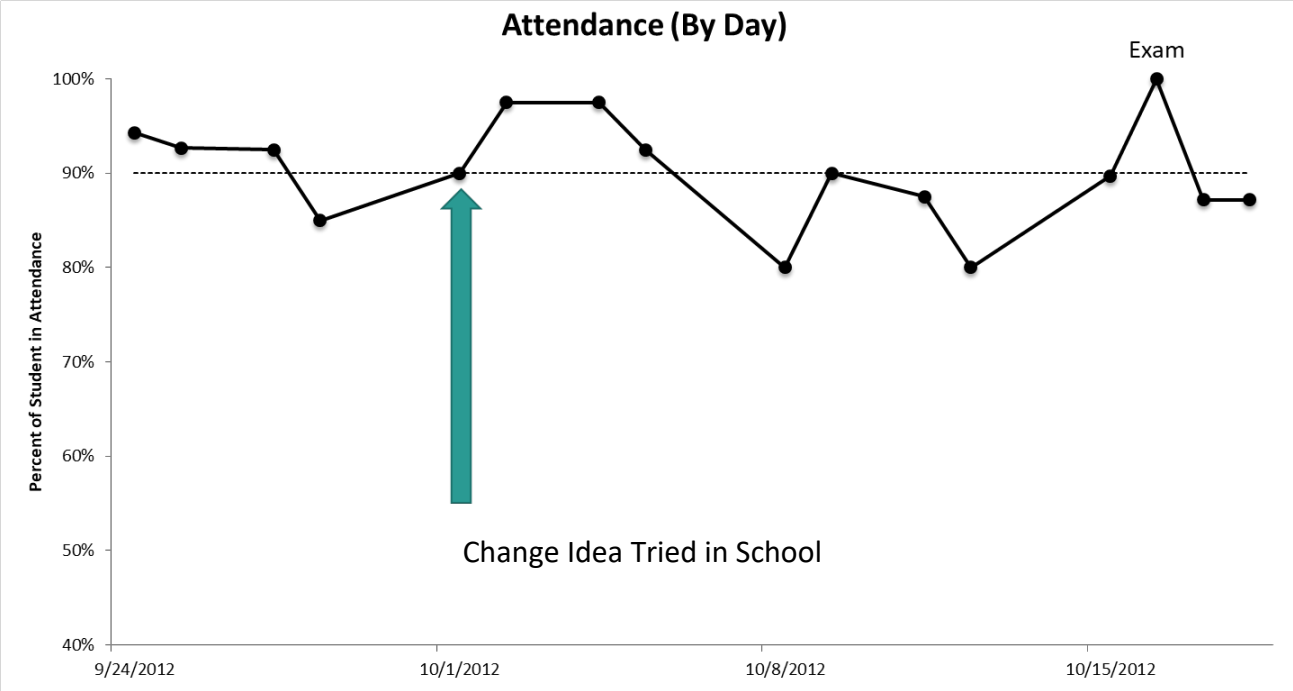
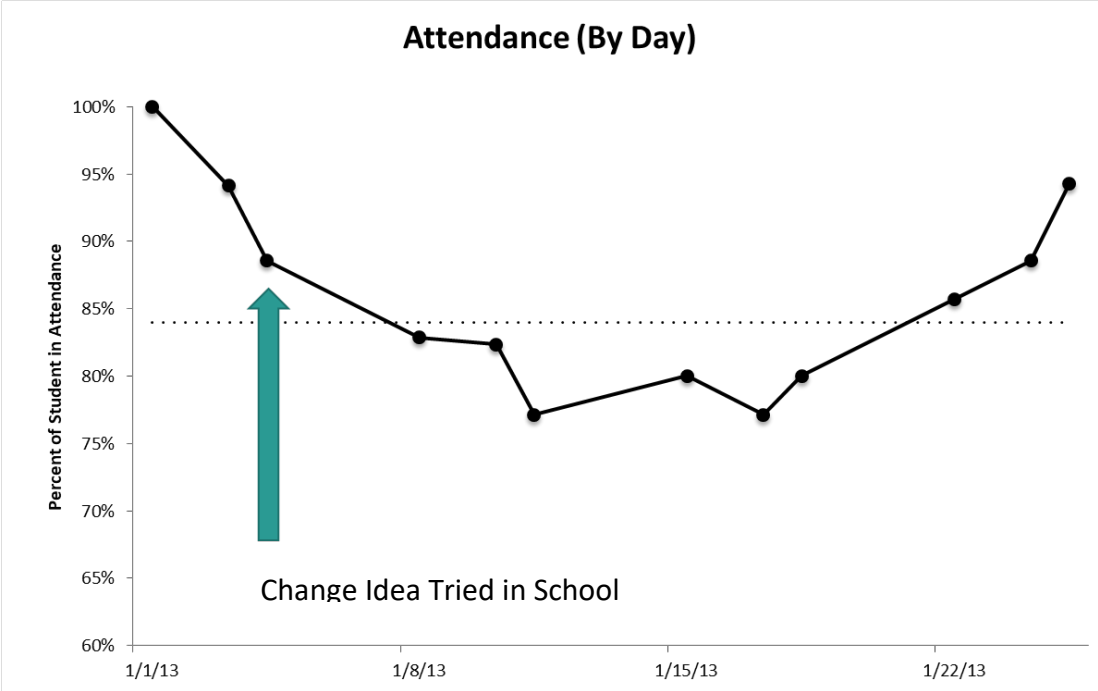
Run Charts Examples

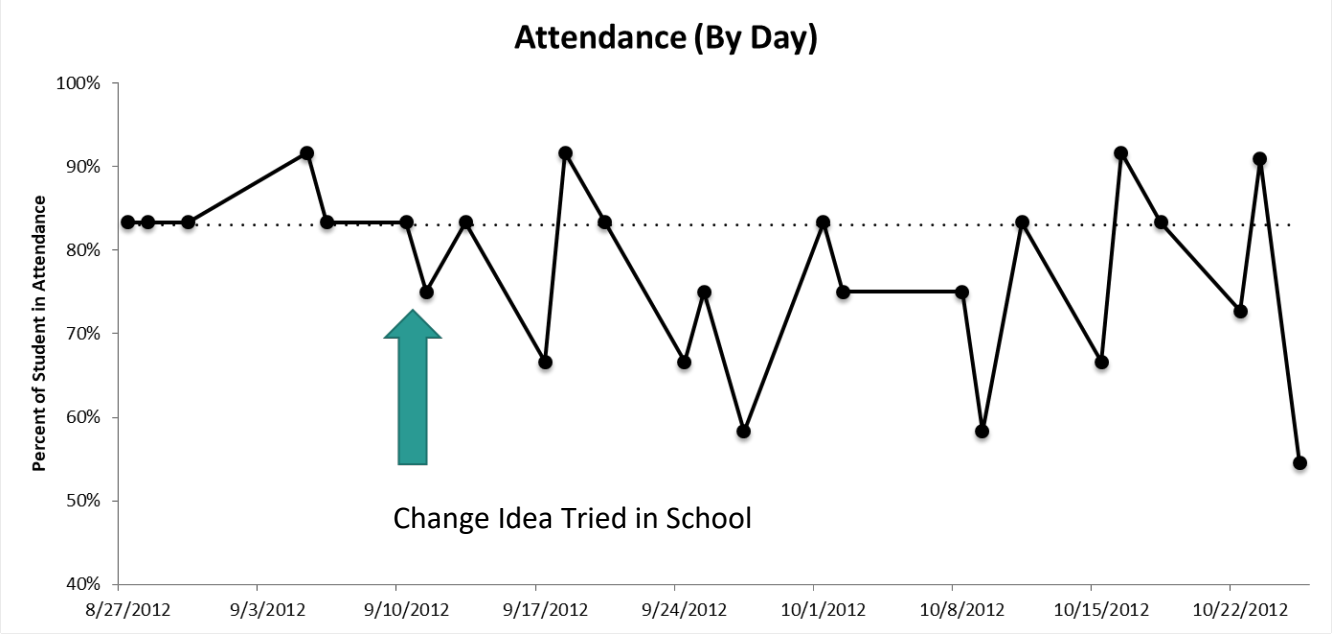
Example 1



Example 2



Example 3



Example 4