RUN CHART HANDOUT

Use this handout to check for too many or too few Runs.

STEP 1: Count the number of data points on the Run Chart, not including those on the median and record that number. Locate and circle that number in Column 1 on the Run Chart Handout.

STEP 2: Count the number of Runs (the number of times the line crosses the median and **add 1**) and record that number.

STEP 3: Now, referencing the Run Chart Handout and using the row selected in Step 1, if the number from Step 2 is less than the number in Column 2, it is a signal (too few Runs), or if it is greater than the number in Column 3, it is a signal (too many Runs).

Number of data points (not on median)	Lower limit for # Runs (fewer is too few)	Upper limit for # Runs (more 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
26	9	19
27	10	19
28	10	20
29	10	20
30	11	21

Number of data points (not on median)	Lower limit for # Runs (fewer is too few)	Upper limit for # Runs (more is too many)
31	11	22
32	11	23
33	12	23
34	12	24
35	12	24
36	13	25
37	13	25
38	14	26
39	14	26
40	15	27
41	15	27
42	16	28
43	16	28
44	17	29
45	17	30
46	17	31
47	18	31
48	18	32
49	19	32
50	19	33
51	20	33

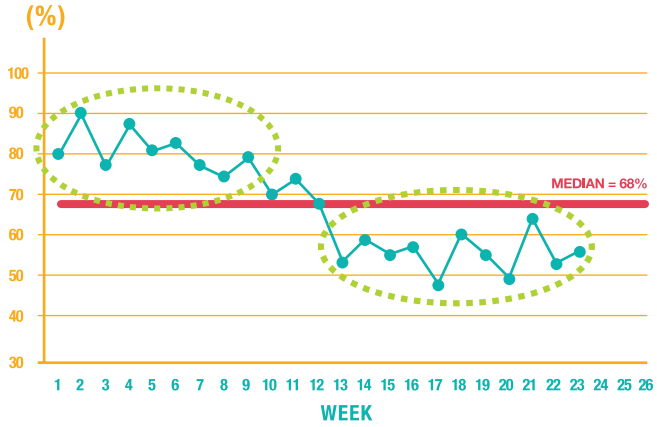
Based on about five per cent risk of failing the run test for random patterns of data. Adapted from Swed, Feda S. and Eisenhart, C. (1943). "Tables for Testing Randomness of Grouping in a Sequence of Alternatives". Annals of Mathematical Statistics. Vol. XIV, pp. 66 and 87, tables II and III. (Data Guide 3 - 18)

RUN CHART RULES

These 4 rules should be used when interpreting your data to determine if non- random variation is occurring signifying that your Change Ideas are having an effect on your system

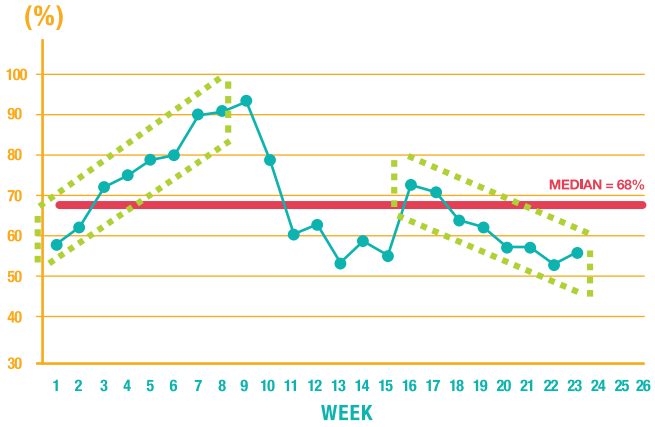
#1: SHIFT

Six or more consecutive data points that are either all above or below the median constitute a **shift**.



#2: TREND

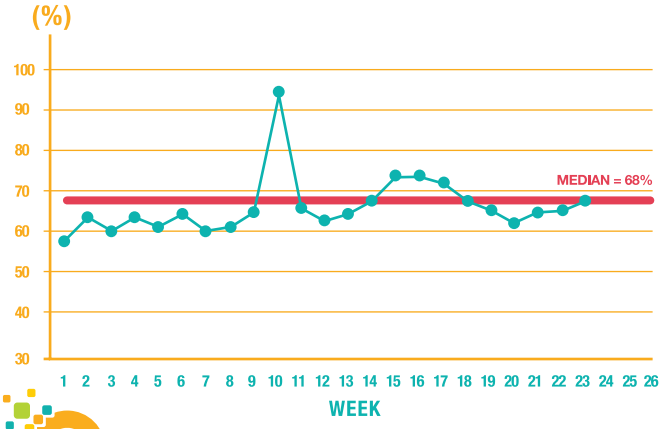
Five data points all going up or down constitutes a **trend**.



#3: ASTRONOMICAL VALUE

An **astronomical value** is a data point that is blatantly different from the rest, and everyone studying the chart agrees that it is unusual.

Remember: Every data set will have high and low values, but these data are not necessarily astronomical.



#4: RUN

A series of points in a row on one side of the median constitutes a **run**. A helpful trick to determine the number of runs is to count the number of times the data line crosses the median and then, add one Statistically significant change is signaled by too few or too many runs.