

# Run Chart Template

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Vertical Axis Label   
 Graph Label

Sample Size (N):

Enter dates or observation numbers into the green cells at right. (clear the sample data before you begin)

Enter your data values into the blue cells. Goal values are optional.

**Don't leave any blank cells in the Date/Observation column.**

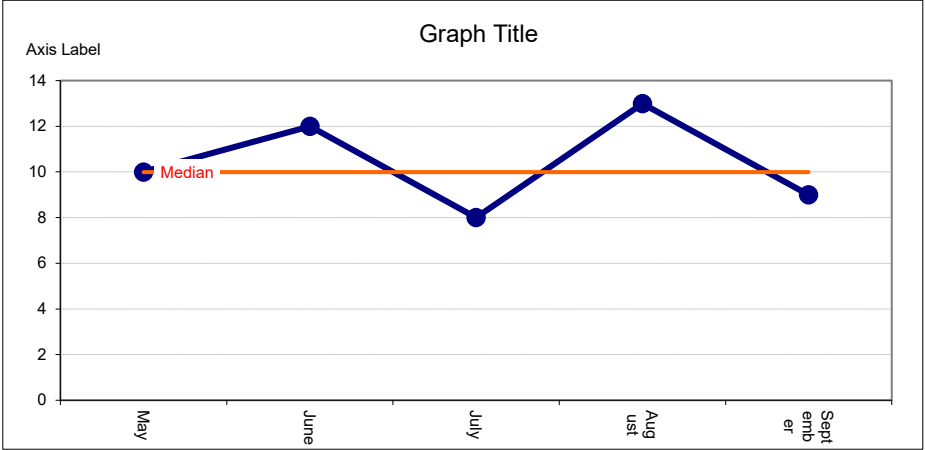
Enter an 'X' into the End Median column to mark the last row to be included in the median

Enter your graph title and y axis label into the cells provided.

Use regular Excel commands to configure the graph.

See sheet 'Rules for Interpreting Charts' for information about interpreting charts

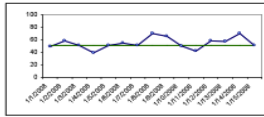
Date / Observation	Value	Median	Goal	End Median
May	10	10		
June	12	10		
July	8	10		
August	13	10		
September	9	10		



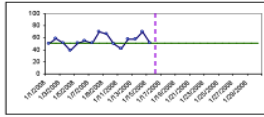
## Procedure for Interpreting Run Charts

### Testing a Change with a Run Chart

1. Plot the baseline



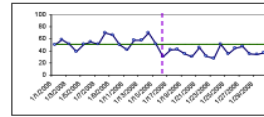
2. Extend the median & begin the test



Aug-4-10-1

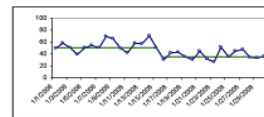
### Testing a Change with a Run Chart

3. Continue to plot data following the change



4. Apply the rules

5. If there was a signal, re-plot with new median



Aug-4-10-2

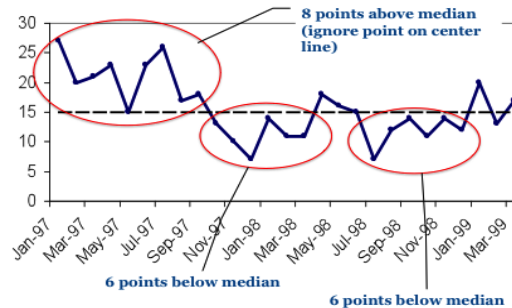
### Run Charts Decision Rules

Signals of an effective change:

- Shift – 6 or more consecutive points above or below the median
- Trend – 5 or more consecutively increasing or decreasing points
- Runs – Are there too many or too few for just common cause variation?
- Astronomical Point – A dramatically different value

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### Signals



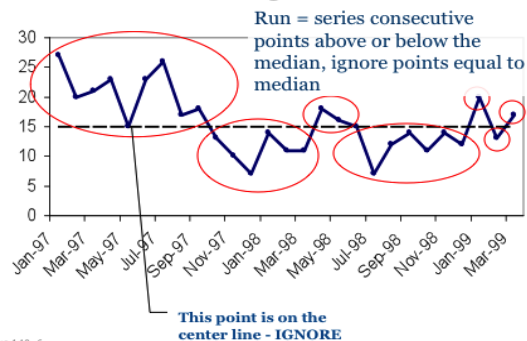
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### A Run

- A run is a sequence of consecutive points which all lie on the same side of the line
- Ignore points exactly on the line!

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### Counting Runs



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### How Many Runs?

- How many runs should we expect if the values all come from the same unchanged process with the baseline median?
- If there are fewer runs (or more), we have a signal that our change has made a difference in the process.
- Use the table on the following slide to determine expected number of runs.

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### Expected Runs Table

Count *USEFUL* values only – ignore those equal to the median!

# obs	Lower	Upper	# obs	Lower	Upper
15	4	12	30	11	20
16	5	12	31	11	21
17	5	13	32	12	22
18	6	13	33	12	22
19	6	14	34	12	23
20	6	15	35	13	23
21	7	15	36	13	24
22	7	16	37	13	25
23	8	16	38	14	25
24	8	17	39	14	26
25	9	17	40	15	26
26	9	18	41	16	27
27	9	19	42	17	28
28	10	18	44	18	30
29	10	20	46	19	31

*If there are no signals in the data, how many runs would we expect to see?*

*If too few, then a signal that change was effective.*

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