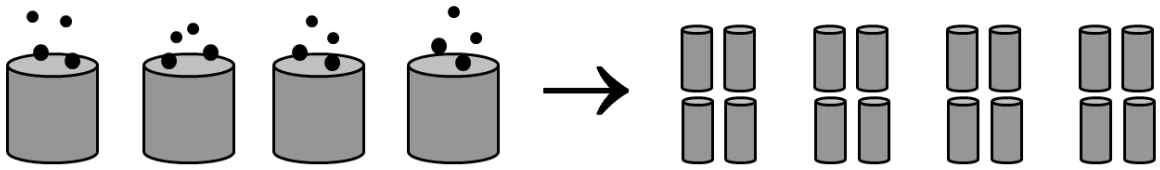
What is a SPLIT PLOT design?

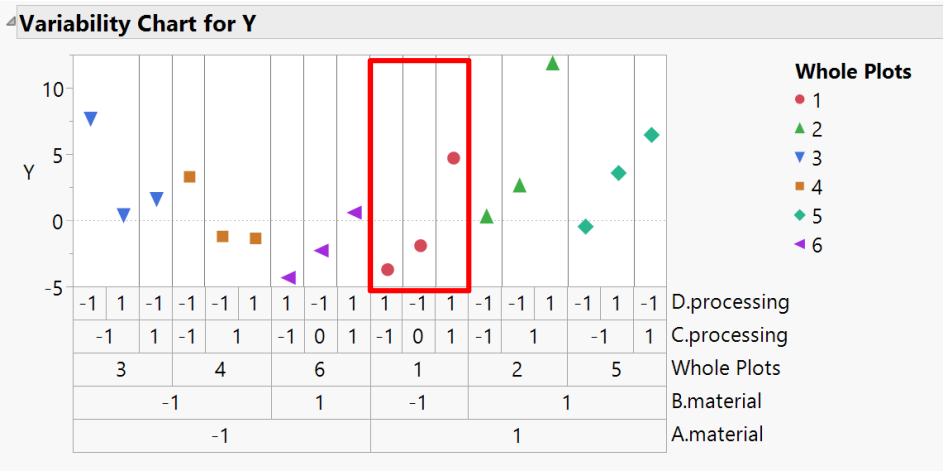
In a split plot design, the runs are GROUPED into whole plots

Example 1:



Here material is prepared in vats, then divided into four vessels per vat. Processing occurs in the vessels.

The levels of some factors (A.material, B.material…) are set per vat; the levels of other factors (C.processing, D. processing…) are set per vessel



Example 2: a single process where some factors are harder to change e.g. heating or cooling an oven. Danger: this can become a Pomelo Experiment!

Note that in Example 1 both the process AND the experimental system have batches, but in example 2, the “batches” only exist in the experimental system, not the future process

Note also that sometimes a response is available after the whole plot step

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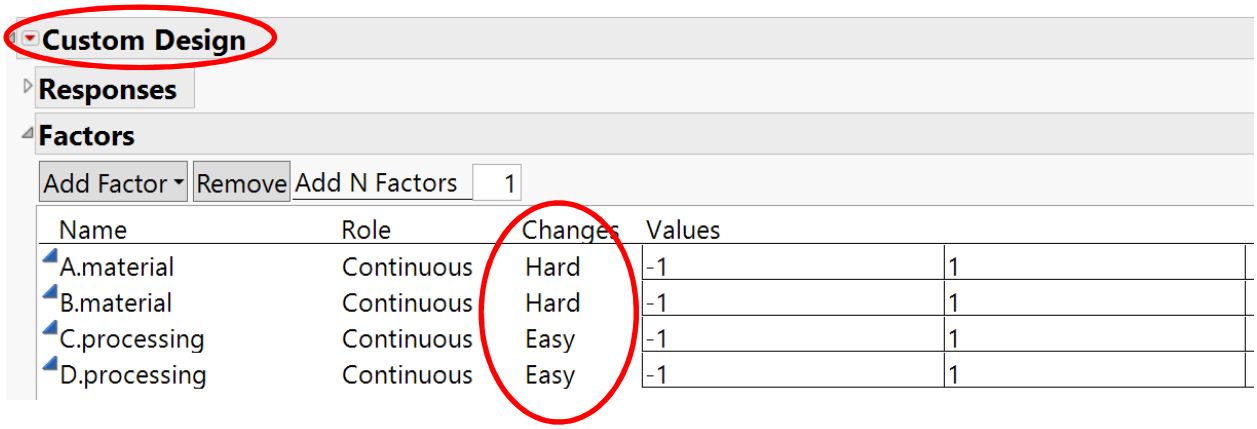
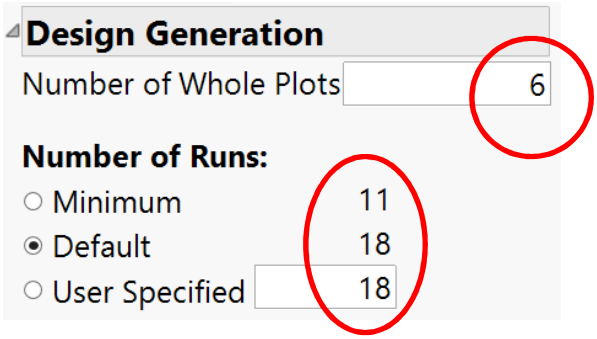
How do we make a split plot design in JMP?





What are the alternatives?

1) Full randomization
2) Build design and analyze the results as if fully randomized, but run in a convenient structure/order i.e. as a split plot (RISKS?)
3) Investigate the hard to change and easy to change factors in separate experiments

What is the statistics going on - this is simple for a change ;-) Note that time/cost of each whole plot and the size of the whole plot component of variation are separate issues

What happens if the process or experimental system has a split plot structure and we ignore it?

Poll questions:

1) Have you run split plot experiments?
2) "I prepared a randomized design but it was run by others in an order they chose" Did this happen to you?

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