

WK 3
CHAPTER 2:

BLOCKING OUT KNOWN SOURCES OF VARIATION

ILLUSTRATION:

PRESCHOOL CHILDREN PICK OUT AND STACK 3 DICE

RESULT IN TABLE 2-3

$$F = \frac{n S_y^2}{S_{pooled}^2} = \frac{(n) \text{ VARIANCE WITHIN DOT MEAN}}{\text{MEAN OF THE VARIANCE}} = 1.92$$

SEE SCATTER PLOT OF TIMES TO STACK DICE - FIG. 2-3

NUMERATOR $\rightarrow$ BETWEEN MEANS ^{COMPARISON} ~~DIFFERENCE~~ = 6 - 1 = 5
DENOMINATOR $\rightarrow$ WITHIN MEANS ^{COMPARISON} = (4-1)(6) = 18

@ 5% RISK $F_{critical} = 2.773$ (FROM TABLE)

$F_{calc} = 1.92 < 2.773$ ∴ RESULTS NOT SIGNIFICANT
GOTO BLOCK/REMOVE VARIABILITY BETWEEN CHILDREN
BY SUBTRACTING DIFFERENCES SHOWN IN TABLE 2-4.

BRING THE MEAN OF CHILDREN TO THE WITHIN DOT MEAN
OF 36.9

HUGE REDUCTION IN OVERALL VARIANCE
FROM 367.8 TO 19.8.

~~THE~~ NUMERATOR IS UNCHANGED

DENOMINATOR $df = \frac{18}{n-1} = \frac{18}{15}$
CORRECTION FACTOR

$df = 18 - 3 = 15$

$$F = \frac{(4)(176.9)}{(19.8)(18/15)} = 29.8$$

df_5
 df_{15} $F_{critical} @ 5\% \text{ RISK} = 2.901 < 29.8$
∴ STATISTICALLY SIGNIFICANT

SEE FIG. 2-4

WK3

Collect HWK 1-2 AS HWK 1

Collect HWK 2-2 AS HWK 2

SYOUTUBE: STATISTICS 101: HYPOTHESIS TESTS FOR THE VARIANCE
PART 1a - DESIGN OF EXPERIMENTS (DOE) → 27 min
ANALYSIS OF VARIANCE (ANOVA). PART 1 → 10 min
" " " " PART 2 → 25 min
" " " " PART 2 → 18 min
ANOVA EXCEL 2010 → 10 min

Go THROUGH ALL EXAMPLES IN CHAPTER 2 w/EXCEL

HWK 3: PROBLEMS 2-3 & 2-4