The study was designed to investigate differences in performance on various mathematics test item types. More than 60% of the KCPE mathematics paper items consist of word problems. For this reason, performance on the word problems of mathematics greatly determines performance on the entire KCPE mathematics papers. The tackling of symbolic items has been considered to be a prerequisite to the solving of word problems of mathematics. This review of the KCPE mathematics papers led the study to investigate the differential performance of pupils on symbolic items and word problems. Noting that the rural and urban area primary schools of most districts in Kenya differed in various school-related factors the study aimed at investigating the extent to which the school-related factor accounted for variation in performance on symbolic items and word problems of mathematics.

The study was carried out in Machakos district. Five rural schools and two urban schools were selected using stratified sampling techniques. All the standard 8 pupils in both the rural and urban schools were tested.

A mathematics test consisting of forty items - twenty symbolic items and twenty word problems, and five subtests of the IDEA battery: (Figure Exclusion, Word Exclusion, Symbol Exclusion, Word Analogy and Mathematics) that loaded heavily on the general reasoning factor (Bali et al., 1984) were administered to the pupils. The scores obtained from the five general reasoning ability measures were utilized as covariates.

The Sign Test was used to test whether there was a significant differences between the p-values obtained from the rural and urban pupils’ on symbolic items and word problems of mathematics. There was no significant differences between the p-values of the rural and urban pupils' symbolic item scores at p < 0.05.

Nevertheless, the p-values of the word problems among the rural pupils were significantly higher than those among the urban pupils. In other words, the urban pupils found the word problems relatively more difficult to tackle compared to the rural pupils.

The Analysis of Covariance was used to investigate the extent to which the school-related factor, accounted for variation in performance on symbolic items and word problems of mathematics. The school-related factor was found to have a significant effect on performance on both symbolic items and word problems of mathematics. The rural school-related factor contributed more to performance on symbolic items and word problems of mathematics than did the urban school-related factor. This clearly shows that the school-related factor, mainly the class size and the mastery of English language as taught in school had a significant effect on pupils performance in mathematics.

Very interestingly, significant differences were observed between the rural and urban pupils' symbolic item mean score after their reasoning ability measures (general, verbal and non-verbal) had been statistically controlled, and not before. The pupils' general reasoning ability accounted for variation in performance on symbolic items. Significant differences were observed between the rural and urban pupils’ word problem mean scores before and after their reasoning ability measures (general, verbal and non-verbal) had been statistically controlled. This revealed very little about the extent to which general reasoning ability accounted for variation in performance on word problems: But since the skills required for the tackling of symbolic items had been found to be prerequisites to the solving of word problems the pupils' general reasoning ability was considered to have accounted for variation in performance on word problems of mathematics.

Careful consideration needed to be given in the future to the design and preparation of test items, the rural school-related factors and the pupils’ general reasoning ability in the teaching and testing of computation and application skills of mathematics.
Additional research is needed to determine the extent to which other factors such as extra tuition, age, repetition and language account for variation in performance on symbolic items and word problems of mathematics. Further research is also needed to investigate the extent to which other mathematics test item types, that is, geometrical and graphical items influence performance on mathematics tests.