

FLUENCY AND REASONING PROFICIENCIES IN A HALVING TASK AMONG PRIMARY LEARNERS IN SOUTH AFRICA

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Poor mathematics performance in South Africa is coupled with a curriculum that stipulates working with tasks beyond what most children can actually do. This generated interest in looking closely at the kinds of Multiplicative Reasoning (MR) proficiencies manifested by primary school learners in South Africa. Fluency and reasoning proficiencies are crucial for overall math achievement. Fluency refers to choosing and carrying out procedures and drawing on known facts, whilst reasoning includes thinking about the relationships between numbers (Askew, 2012). The present study identifies fluency and reasoning proficiencies shown by Grade 4 and 6 learners in a halving task using Askew (2012) actions of proficiencies as a guiding framework.

A task-based interview assessment was administered to assess MR proficiencies with a sample of 18 learners (9 Grade 4 and 9 Grade 6). These learners were selected across the attainment range – three low, three middle and three high. Items tested were set below the curriculum expectation. The items include half of 202, half of 146 and half of 152 which were presented to learners in Grade 4 and Grade 6.

Across the attainment range in both grades, all the learners demonstrated fluencies with single digit halving when the digits were even. However, when the number included odd digits such as 146 and 152, these fluencies were absent and/or limited amongst all the low and some middle attaining learners. Low attaining learners worked by halving digits and were usually unable to work spontaneously with the underlying values i.e. “H of 146 = 123” and in H of 152, “H of 2 is 1, you can’t halve 5 and H of 2 is 1”, “H of 152 = 53 ½” and “H of 152 = 51”. In contrast, middle and high attaining learners could partition numbers according to place value, halve these partitions and re-join the partial halves, indicating awareness of how to use place value decomposition relationships for halving. These proficiencies were more spontaneous among high attaining learners than they were with middle attaining learners who at times required prompting to either partition or re-join the numbers. In the Grade 6 sample, middle and high attaining learners demonstrated more spontaneous proficiencies than the Grade 4’s in the same attainment range as would be expected given that they have had longer exposure to these concepts. While these proficiencies were more spontaneous in Grade 6, their responses indicted the extent of these proficiencies despite longer exposure to the content. Furthermore, by identifying these proficiencies, this study aims to contribute to closing the gap between learning and the mandated curriculum.

References

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