

Representing Multiple Constructs of Fractions on a Triple Number Line

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Number lines are a key representation for developing fraction understanding, especially when working with fraction equivalence (Siemon et al., 2015). To help mediate primary school learners' experience and representation of multiple meanings of fractions (the part-whole, ratio, and measure constructs), this study, integrating music and mathematics, involved the design of an imaginary problem scenario where various African animals had to jump across a river of constant distance in a constant time. Each animal took a different number of jumps to cross. We used number lines to represent the jumps, moving, as shown in Figure 1, below (left-hand side), from informal representations of animal river-crossing jumps, to a linear musical representation of learners' claps accompanying the animal jumps, to then placing fraction strips onto a third number line.

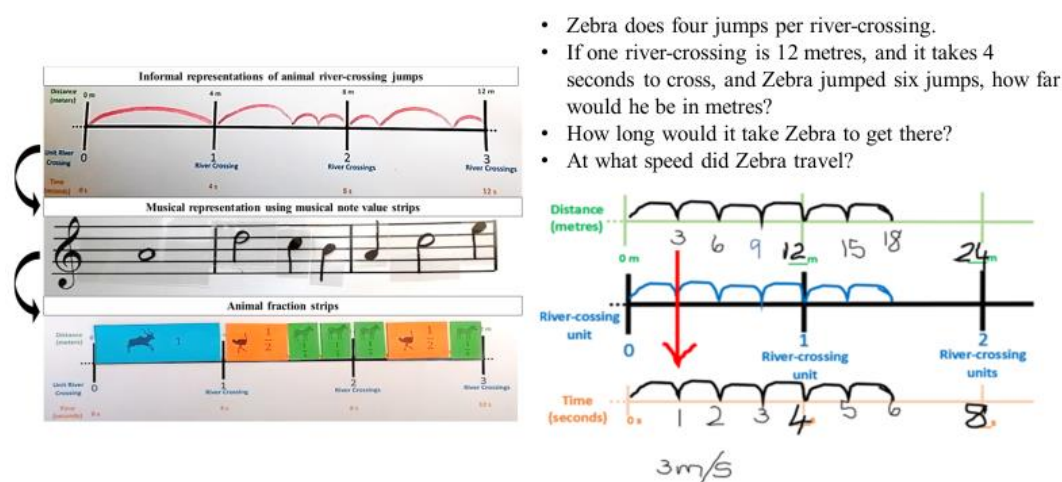


Figure 1. Linear musical and mathematical representations aligned, followed by an example of a learner's problem-solving using a triple number line

As also shown in Figure 1, above (right-hand side), we found that the animal river-crossing scenario allowed for solving problems using a triple number line in a way that supported links between different fraction meanings. To find out more about our study and to access our online resources, we invite you to visit the paper we presented at MERGA's 45th Annual Conference in July 2023.

References

Siemon, D., Beswick, K., Brady, K., Clark, J., Faragher, R., & Warren, E. (2015). *Teaching mathematics: Foundation to middle Years*. (2nd ed.). Oxford.

For more information, please refer to the following paper presented at the 45th Annual Conference of MERGA in July 2023. Lovemore, T., Robertson, S-A., & Graven, M. (2023). Using a triple number line to represent multiple constructs of fractions: A task design process and product. In B. Reid-O'Connor, E. Prieto-Rodriguez, K. Holmes & A. Hughes (Eds.), *Weaving mathematics education research from all perspectives (Proceedings of the 45th Annual Conference of the Mathematics Education Research Group of Australasia)*. (pp. 339-346). Newcastle, Australia: The Mathematics Education Research Group of Australasia Inc.