Foreword

Seeking to promote literacy around key scientific concepts, *Understanding Concepts in Mathematics and Science* is an outstanding, pioneering, and innovative research-based approach and contribution to learning, teaching, and pedagogy in mathematics, science, biology, and geography.

Presented simultaneously in English, IsiXhosa, IsiZulu, and Afrikaans, the novel multilingual character of the book, which has undergone extensive and robust trialling in the Western Cape, Eastern Cape, and KwaZulu-Natal, signals the acute grasp of those associated with its production that in South Africa the form of a book is as important as its content.

It is the close attention to and appreciation of the salience of form that makes this an exciting, imaginative and innovative resource for learners and teachers. For form is seldom neutral but shaped by values. Form is also shaped by context. Form is furthermore shaped by the mind, whether memory or the infinite creative imagination and innovation that the human mind is capable of. Finally, form is shaped by human choices and collective endeavour.

The book illuminates what the historian Harvey Kaye calls 'prophetic memory'[i]- *remembrance* of the oppressive role that language has played in our history to thwart the potential of non-English or Afrikaans speaking learners and marginalise social groups; *critique* of the injustice of the continuing lack of effective educational opportunities for millions of learners; c*onsciousness* of the educational and social challenges of our present and that our history teaches that nothing is gained without creativity, boldness and determined endeavour; *imagination* to conceive of new ways of doing; and the *desire* to remake our schooling, induct learners into scientific literacy, and through these to help reshape our country.

The researchers and authors, supported by donors and the publisher, boldly and determinedly opt for a multilingual approach. They are to be commended, for this is no simple task. On the one hand they must confront the legacy of the historical underdevelopment and marginalisation, especially in so far as scientific discourse is concerned, of indigenous languages such as IsiXhosa and IsiZulu. On the other hand they must deal with and communicate intelligently key scientific concepts which are embedded in complex theories and discourses.

Undaunted by their choice and harnessing the power of creative imagination and collective intellectual labour, the authors have inspired a resource book that wonderfully embodies their commitment to both enhancing knowledge and understanding and facilitating learning and teaching in the vital areas of mathematics and science, and also giving

effect to the constitutional imperative of promoting multilingualism in a concrete and practical manner rather than in some largely symbolic way.

The development of mathematics and science registers and the publishing of scientific texts in indigenous languages remain pressing and urgent issues. The book is not a substitute for these important yet to be accomplished tasks, but will hopefully provide courage and impetus in these regards.

Finally, this resource book, with its pioneering (even if provisional) translations and extensive illustrations and photographs, is ample testimony to the rich rewards of creative and collective endeavour across academic disciplines and fields, and universities and other institutions (Rhodes, Cape Town, KwaZulu-Natal, schools and foundations). In this regard, it is to be regretted that the arts, humanities and natural sciences collaborate all too rarely, and to be hoped that this outstanding achievement will encourage further and greater endeavours among scholars across disciplines and fields and among various institutions in the common pursuit of the advancement of education and learning.

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[i] Kaye, H. J. (1996) *Why do Ruling Classes Fear History and Other Questions*. New York: St Martin's Press