'I KNOW MY MATHS': NUMBER CONCEPT, PLACE VALUE, BASIC OPERATIONS

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Mathematics Education Primary Programme

TARGET AUDIENCE: Foundation phase teachers

DURATION: 2 hours

MAXIMUM NO. OF PARTICIPANTS: maximum 30 participants in the workshop.

ABSTRACT

This workshop is aimed at Foundation phase teachers and describes the product of a professional development project involving nine teacher and two curriculum advisors of the South District in the Western Cape Department of Education for the period 2009 -2011. The work cards focus on the mathematics content that learners must know for each grade in Foundation phase that is specified by Curriculum Assessment Policy Statement (CAPS). We look at exploring practical effective approaches to the teaching of mathematics in the early years of school using a variety of manipulative models for teaching and the 'I know my maths' work cards at the beginning or end of teaching particular skills and concepts. Teachers will engage with practical activities and discussions prior to the use of the cards and to consolidate the mathematics that learners need to master. The workshop involves four main components:

1. The purpose and how work cards can be used to increase content knowledge and to consolidate concepts.
2. Overview of the CAPS document on number, operations and relationships
3. Task-based practical activities for conceptual understanding prior to the use of the cards and for assessment on the topics on number concept, mental maths, place value and basic operation.
4. Assessment, evaluation and reflection.

This workshop will make available and engage teachers in each of these components, and the changes in teaching practice, teacher comments and evaluation using the work cards with their learners.

Participants are required to reflect on their role during some of the tasks. Teachers not only teach content but also implicitly transmit attitudes and understandings about their own mathematics. Whether it is desirable or not, learners think of teachers as models of "correct problem-solving behaviours." As teachers act out or demonstrate solutions to problems, it is especially important for them to be able to reflect on their own problem-solving behaviours and to help learners identify their own metacognitive processes. The ability to accurately and insightfully observe one's own problem-solving skills and strategies may be closely related to the ability to

Agherdien, G. (2013). 'I know my maths'. Number concept, place value, basic operations. In Z. Davis & S. Jaffer (Eds.), *Proceedings of the 19th Annual National Congress of the Association for Mathematics Education of South Africa*, Vol. 2 (pp. 1 – 7). Cape Town: AMESA.

accurately observe, describe, and critique the problem-solving behaviour of others. (Post, Harel, Behr & Lesh, 1988).

MOTIVATION

Why is this workshop important and how will it help participants?

The workshop is important for participants to experience how crucial the content of the curriculum, teaching methodologies, as well as the practising of skills and strategies by children are. The workshop will give participants the opportunity to engage with the teaching and learning of number concepts, mental mathematics, operations and relationships. The workshop will cover the number work for the Foundation phase learners of mathematics for the Curriculum and Assessment Policy Statements (CAPS). Children must become efficient and confident when working with numbers. The 'I know my maths' work cards are number work cards that will assist learners with number concept, mental strategies and place value. Through drill, practice and written work, children consolidate their basic number facts and become fluent in operating with numbers. Teachers using the work cards in their classes will be able to consolidate learners knowledge. The exposure to a variety of teaching ideas will increase teachers' confidence in methodologies.

It is generally held that children are not doing enough numeracy writing. The systemic evaluations indicated that in 2001 the numeracy mean score was 30%. This increased to 35% in 2007. Not much has changed in the last five years and the score for South African learners still is quite low in the world ranking. What the workshop will attempt to show is using the work cards in a manner that promotes sufficient time in writing by learners recording their work, as well as manipulating the number work in a manner that more than adequately covers the content in the prescribed time. It will consider the CAPS guidelines and the number range for each grade. The aim in effect is to enhance the mathematical learning of Foundation phase children by increasing the professional skills of their teachers.

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CONTENT

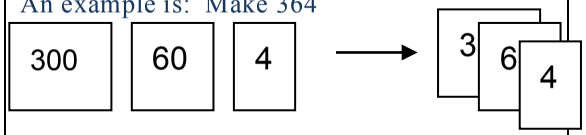
The workshop will cover the following content:

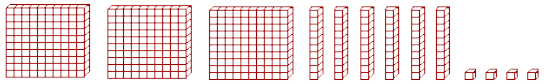
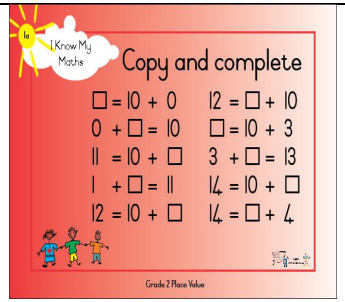
Number concept, mental mathematics, place value, addition, repeated addition, subtraction, multiplication and division.

Workshops

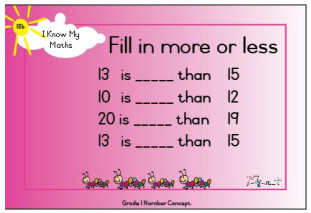
	Duration	Classroom organisation	Resources
Introduction: What are the 'I know my maths workcards?' Its a number resource for foundation phase learners. Through drill and practice, children consolidate their basic number facts and become fluent in operating with numbers. Each grade box of *I know my Math's work cards* consist of: • 600 work cards, with 5 to 10 sums on each side of the card • Over 6000 sums! • Cards develop progressively in difficulty, according to the number range prescribed by the Foundation Phase CAPS The work cards can be used during the following teaching moments: • Small group sessions on the mat • Independent work • Whole class activity when concepts are consolidated • Mental mathematics	10 minutes	Whole class Grade groups	workcards for each topic + cards on display of each grade for each group. See attachment for examples of workcards A box of cards for each grade will be available to all teacher

• Homework • As a form of Assessment			
Overview of CAPS Specific focus on the main progression in Numbers, Operations and Relationships. • - The increase in number range - Different kinds of numbers are introduced. - The calculation strategies change. • As the number range for doing calculations increases up to Grade 3, learners should develop more efficient strategies for calculations. • Contextual problems should take account of the number range for the grade as well as the calculation competencies of learners	10 minutes	In small grade groups	Teachers required to bring their CAPS doc. Overview of the maths in FP phase
Number concept and mental mathematics practical tasks 1.Mental maths activity 2. The following skills will be focused on: ▪ Oral counting: counting forwards and	40minutes Grade groups, Individual tasks		Counters, string beads, Abacus, Interlocking cubes 120 chart Writing booklets

backwards from any number (range specific to grade) ▪ Learning different number meaning and functions ▪ Subitising ▪ Sequencing ▪ Resultative counting ▪ Estimating ▪ Representing numbers ▪ symbolising numbers ▪ Building up and breaking down numbers ▪ Number lines (structured and unstructured numberlines) 3. Work card writing task • consolidation written work from workcards on number concept • addition for individual grades.		Number concept work cards for each grade.
Place Value: practical tasks using the manipulatives Learners must know the difference between a *digit* and *place value*. Learners should also understand that the 7 in 71 and 723 and 7 have different meanings. Building up and breaking down numbers, dienes block and using place-value/ flard cards is explored during this task for understanding the concept of place value. An example is: Make 364 	20 minutes Work in pairs or groups of 3.	Dienes block Interlocking cubes Place-value/flard cards Place value mats

 ▪ Doubling and halving ▪ Rounding off ▪ Multiples ▪ Word problems Work card writing task Teachers to complete at least one work card of place value from a grade that they teach.	 	
Addition and repeated addition Apply following strategies: • Turn around – biggest number first and add 4+ 17 ----- 17 +4 • Use concept of doubling 15+15 • Use concept of near doubles 25+27 • **Rounding off**	25minutes 	

Workshops

Assessment How to use work cards as an assessment tool. 	15minutes 	
Reflection and evaluation	10minutes	