



FACULTY	EDUCATION AND HUMAN SCIENCES
SCHOOL	EDUCATION
DEPARTMENT	EARLY CHILDHOOD EDUCATION AND CARE
SUBJECT	NUMERACY AND MATHEMATICS EDUCATION 2
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DURATION	2 HRS MARKS: 100

SECOND OPPORTUNITY EXAMINATION

EXAMINER: Mr K Muswalali (University of Namibia)

EXTERNAL MODERATOR: Dr Gierdien

INSTRUCTIONS TO CANDIDATE:

- 1. This question paper consists of nine (4) pages including the cover page.**
- 2. Answer ALL the questions.**
- 3. Number your questions correctly.**
- 4. Read the questions carefully before you answer.**
- 5. Please note that cheating in the examination will result in a fail.**

UNIVERSITY OF NAMIBIA EXAMINATION QUESTION PAPER

SECTION A

QUESTION 1: True or false

Write whether the following statements are true or false.

1. The van Hiele levels of geometric thought are age dependent. **False**
2. Basic math and number concepts utilized in a preschool or kindergarten classroom set the foundation for learning more advanced math concepts. **True**
3. Understanding numbers and the relationships between them is called number sense. **True**
4. If you count one, two, three, then three (the last number name used) is not the quantity in the group. **False**
5. Conceptual subitizing leads to addition and subtraction concepts. **True**
6. Learning trajectories help learners to stay on the same level that they are. **False**
7. Frans has 5 more story books than Anna. Anna has 15 story books. How many story books does Frans have? This is an example of a compare problem structure: small set unknown. **False**
8. It is important to include 0 for addition sums to let learners discover that 0 has an identity in addition and subtraction sums. **True**
9. Partitioning is the process to find the answer is broken into smaller chunks or steps. **True**
10. An algorithm is a detailed step-by-step instruction set or formula for solving a problem or completing a task. **True**

[10 Marks]

QUESTION 2: MATCHING

Match the statements with the concept: e.g. 1-B. 1X2

1. I
2. C
3. D
4. B
5. A
6. E
7. F
8. G
9. J
10. H

[20 MARKS]

SECTION B: STRUCTURED QUESTIONS

2.1. Before children can reach a stage where they are able to carry out mental computation, they first have to go through very primitive stages. Just like a baby. Before the baby can finally walk, they first have to learn how to crawl. Using the above description, Plan a learning trajectory for the concept of “Addition and subtraction” state and describe each stage clearly

Age Range	Level Name	Level	Description
1	Pre $+/ -$	1	At the earliest level a child shows no sign of being able to add or subtract.
3	Nonverbal $+/ -$	2	The first inkling of development is when a child can add and subtract very small collections nonverbally. For example, when shown two objects, then one object going under a napkin, the child identifies or makes a set of three objects to “match.”

Age Range	Level Name	Level	Description
4	Small Number $+/ -$	3	The next level of development is when a child can find sums for joining problems up to $3 + 2$ by counting all with objects. For example, when asked, “You have 2 balls and get 1 more. How many in all?” counts out 2, then counts out 1 more, then counts all 3: “1, 2, 3, 3!”

2.2. Formulate story sums under the following word problem types and structures

- a). **Join word problem:** *Jenny has two sweets. Her friend gives her three more sweets. How many sweets does she have altogether?*
- b). **Separate word problem:** *Mr Muswalali has seven mustard seeds. He gives away three mustard seeds to his colleagues. How many mustard seeds does Mr Muswalali have left?*
- c). **Compare word problem:** *Junior has three biscuits while Chris has four more. How many more biscuits does Chris have compared to Junior?*
- d). **Part-part-whole word problem:** *there are twelve male and six female in a numeracy class. How many students are in that class altogether?*
- e). **Join word problem (initial unknown):** *Nella has some oranges. Her brother gives her three more oranges. She now has seven apples. How many oranges did she have before?*

f). **Part-part-whole word problem (whole unknown):** *there are ten girls and five boys in a grade 3 classroom. How many learners are in that classroom altogether?*

2.3. 3D shapes are solid and have three dimensions known as length, height and width. According to Van Hiele, understanding geometry (shapes) follows a certain progression (levels). Using Van Hiele theory, briefly discuss the levels with reference to how learners learn 3d shapes (In levels)

Level 0 Visualization (Basic visualization or Recognition): *At this level pupils use visual perception and nonverbal thinking. They recognize 3D geometric figures by their shape as “a whole” and compare the figures with their prototypes or everyday things (“it looks like door”), categorize them (“it is/ it is nota...”). They use simple language. They do not identify the properties of geometric figures.*

Level 1 Analysis (Description): *At this level pupils (students) start analysing and naming properties of 3D geometric figures. They do not see relationships between properties, they think all properties are important (= there is no difference between necessary and sufficient properties). They do not see a need for proof of facts discovered empirically. They can measure, fold and cut paper, use geometric software etc.*

Level 2 Abstraction (Informal deduction or Ordering or Relational): *At this level pupils or students perceive relationships between 3D figures and their properties. They create meaningful definitions. They are able to give simple arguments to justify their reasoning. They can draw logical maps and diagrams. They use sketches, grid paper, geometric SW*

Level 3: deduction: *At this stage, learners are able to examine more than just the properties of 3D shapes. The learner is able to work with abstract statements about geometric properties and can make conclusions based on logic. High school learners will display thoughts related to this level.*

Level 4 rigor: *This is the highest level of the Van Hiele hierarchy and learners are now able to appreciate the distinctions and relationships between different axiomatic systems. Students at college level should be at this level of thinking.*

[50 marks]

QUESTION 3

3.1. Demonstrate 434-275 to Grade 3 learners using left to right or column notation strategy

- $400-200=200$; later 300
- Borrow a 100 from 400 and join it to 30, it becomes 130
- $130-70= 60$; later 50
- Borrow a 10 from 60 and join it to 4, it becomes 14
- $14-5= 9$
- $300+50+9= 359$

3.2. Mention any 5 models or teaching aids you can use to teach multiplication

- Bottle tops
- Number line

- *Abacus*
- *Five frame*
- *Ten frame*
- *Number chart*

[10 Marks]

GRAND TOTAL: 100 MARKS