**MATHEMATICS LESSON PLAN**

**GRADE 7**

**TERM 3: July – September**

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| **PROVINCE:** |  |
| **DISTRICT:** |  |
| **SCHOOL:** |  |
| **TEACHER’S NAME:** |  |
| **DATE:** |  |
| **DURATION**: | 1 Hour |

1. **TOPIC: NUMERIC AND GEOMETRIC PATTERNS**: Geometric patterns **(Lesson 5 )**

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson, learners should be able to :**   * Investigate and extend geometric patterns looking for relationships between numbers, including patterns: * limited to sequences involving a constant ratio. * of learners’ own creation? * represented in tables * describe and justify the general rules for observed relationships in own words |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo book 2, Textbooks |
| 1. **PRIOR KNOWLEDGE:** | * Number sentence * Algebraic language |
| 1. **REVIEW AND CORRECTION OF HOMEWORK** (suggested time: 10 minutes)   Homework provides an opportunity for teachers to track learners’ progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions. | |
| 1. **INTRODUCTION**(Suggested time: 10 Minutes)   Introduce the lesson by asking learners in their pairs to respond to the following questions  **Stage1**  **Stage 2**  **Stage 3**  **Stage4**   1. Extend the pattern above by drawing the fifth stage 2. Describe the pattern in own words   **Note:** Learners should be able to recognise that in order to get the number of circles for a particular stage, they have to double the number of circles in the previous stage. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT**(Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present the following activity to learners  **Activity**   1. How many circles will be there on the 5th stage of the geometric pattern 2. Describe the rule in own words 3. Write down the rule in a number sentence 4. Use the general rule to calculate the number of circles for the 5th stage   Stage1  Stage 2  Stage 3  Stage4  NB: Provide guidance to learners so that they can investigate the pattern. The most obvious description is: double the number of circles in figure 1 to get the number of circles in figure 2. The investigation will help them to go beyond the description which is informed by **recursive relationship** to a more detailed description which is influenced by **structural analysis**. | Step 1  Work in small groups of 2 to 3 members to investigate the geometric pattern. |
| Two key questions lie at the centre of the investigation to be conducted by learners.   1. What is the connection between the **physical structure** (construction) and the **numeric representation** at each stage of the pattern? 2. How does analysis of structure assist in developing the general rule for the pattern?   Investigate the rule for the pattern above  **Diagram form**  **Exponential form**  **Numeric (Expanded form)**  Stage 1    Stage 2  Stage 3  Stage  Stage  **Representation in table**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Stage number |  |  |  |  |  |  | | Number of  Circles | 2 |  |  |  |  |  | | Equivalent descriptions |  |  |  |  |  |  | | Equivalent descriptions |  |  |  |  |  |  |   NB: It is important to develop understanding of geometric patterns by encouraging learners to establish **connections** between different representations. The analysis of structure through investigation becomes helpful in assisting learners to “see” **equivalent expressions** and to develop the general rule for the pattern.  Consolidate learners’ thoughts from the investigations as follows:  In words : **description before the investigation**(verbal description)  double the number of circles in the previous term to get the next term  (this description relied on recursive relationship)  **Description after the investigation may take this form**  **( general rule)**  2 raised to exponent of the stage or term number.  (this description is now informed by analysis of the structure)  Both descriptions are correct,thefirst one shows the relationship between the physical structures and the latter showsthe relationship between position of the structure and the structure itself.  In flow diagram :  As an algebraic rule : | Step 2  Use a table to record information from the investigation.  Step 3  Respond to the four questions posed at the beginning of the activity |

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| 1. **CLASSWORK**(Suggested time: 15 minutes) 2. Write down the next 3 terms of the sequence below   5; 10; 20; \_\_\_\_\_\_\_\_\_; \_\_\_\_\_\_\_\_\_; \_\_\_\_\_\_\_\_\_\_\_   1. Write down the general rule for the pattern. 2. Study the pattern below and answer questions that follow   **Stage 1**  **Stage 2**  **Stage 3**   1. Explain the pattern in own words 2. How many circles will be there in the 4th stage? 3. Draw a table to show the relationship between input and output values. 4. Write down the general rule in algebraic language 5. Use your rule to find out the number of circles in the 5th stage. |

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| 1. **CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)** |
| 1. Emphasise that:  * A sequence can be formed by repeatedly multiplying or dividing by the same number.  1. The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of ‘Less is more’ is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners’ conceptual understanding.   Carefully select appropriate activities from the Sasol-Inzalo books, workbooks and/or textbooks for learners’ homework. The selected activities should address different cognitive levels.  **Recommended Homework**:    Use DBE workbook to check any suitable activity for extra homework activity. |