**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 1: January – March**

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

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| 1. **TOPIC: WHOLE NUMBERS: Solving problems (Lesson 4)** |
| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to** solve problems involving whole numbers, including:   * Comparing two or more quantities of the same kind (ratio) * Comparing two quantities of different kinds (rate) * Sharing in a given ratio where the whole is given * Increasing or decreasing of a number in a given ratio |

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| 1. **RESOURCES:** | Textbooks, DBE Workbook, Sasol-Inzalo Book, Calculator. | |
| 1. **PRIOR KNOWLEDGE:** | Properties of whole numbers including ratio and rate as done in Grade 7 | |
| 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) | | |
| Teacher revise the concepts using Mental maths type questions to include :   * Multiplication tables up to 12 x 12 * ratio and rate. * Distance, speed and time. | | |
| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | | |
| **Teaching activities** | | **Learning activities**  **(Learners are expected to : )** |
| **Solving problems**:  **Teacher explains the concepts to learners using the information and examples below:** | |  |
| **THE CONCEPT OF RATIO**   * Different colour beads can be used to make necklaces in a specific ratio. * In pattern A below, there are 5 red beads for every 4 yellow beads.      * Ask learners to describe patterns B and C in the same way. * In pattern A, the **ratio** of yellow beads to red beads is 4 to 5. This is written as 4: 5. In pattern B, the ratio between yellow beads and red beads is 3: 6. In pattern C the ratio is 2: 7. * Here we are comparing quantities of the same kind. In pattern A for every 4 yellow beads there are 5 red beads, the **ratio** of yellow beads to red beads is 4 to 5. This is written as 4:5. In pattern B for every 3 yellow beads there are 6 red beads, the **ratio** of yellow beads to red beads is 3 to 6. This is written as 3:6. In pattern C for every 2 yellow beads there are 7 red beads, the **ratio** of yellow beads to red beads is 2 to 7. This is written as 2:7. * We use **ratios** to show how many times more, or less, one quantity is than another. | | Describe patterns B and C |
| * Consider the following: * **Example A**: Nathi, Paul and Tim worked in Mr Setati’s garden. Nathi worked for 5 hours, Paul for 4 hours and Tim for 3 hours. Mr Setati gave the boys R600 for their work. How should they divide the R600 among the three of them? * Explain that the number of hours that Nathi, Paul and Tim worked are in the ratio 5: 4: 3. To be fair, the money should also be shared in that ratio. That means that Nathi should receive 5 parts, Paul 4 parts and Tim 3 parts of the money. There were 12 parts in total, which means Nathi should receive of the total amount:, Paul should get of the total amount: and Tim should get of the total amount:. * Check that | | Working in pairs to attempt example A. Answers and methods are shared with the whole class. |
| * **Example B**: Ask learners to divide 840 in the ratio 3: 4. * The teacher will identify misconceptions and correct them. | | In groups work on example B. Answers are discussed by the whole class. |
| * **Example C:** To increase 40 in the ratio 2: 3 means that the 40 represents two parts and must be increased so that the new number represents 3 parts. If 40 represents two parts, 20 represents 1 part. The increased number will therefore be 20 × 3 = 60.   **OR**  Increase 40 in the ratio 2 : 3  = 60   * **Example D**: To decrease 72 in the ratio 4: 3 means that the 72 represents 4 parts and must be decreased so that the new number represents 3 parts. If 72 represents 4 parts, then 18 represents 1 part. The decreased number will therefore be. | | Respond to leading questions posed by the teacher. |
| **THE CONCEPT OF RATE**   * Introduce the concept of rate in the following contexts:   + The cost of petrol is currently R8,34 per litre   + The cost of a long-distance telephone call is R1,85 per minute   + The specific mass of a certain material is 3,4 g per cm3   + At 16:00 on a certain day, cars passed through a certain town at a rate of 840 cars per hour   + Water is pumped into a reservoir at a rate of 7 485 litres per hour. * With a rate, we describe how much of one quantity (e.g. price, mass, number of cars, amount of water) corresponds to one unit of another quantity (e.g. volume, time). * Learning to interpret and use the word “**pe**r” is a crucial element of acquiring the concept of rate. The word **per** is often used to describe a rate and can mean *for every*, *for*, *in each*, *in*, *out of*, or *every*. | | In each group will receive a problem involving rate. Learners will discuss the problem and come up with one or more ways to solve the problem. All groups will share their solutions with the rest of the class.  Come up with their own examples of rate. |
| **TIME, SPEED AND DISTANCE**   * Example **E**: A car travels a distance of 180 km in 2 hours on a straight road. How many kilometres can it travel in 3 hours at the same speed?   In 1 hour the car travels  In 3 hour it will travel  It will travel 270 km | | In each group will receive a problem involving speed, distance and time. Learners will discuss the problem and come up with one or more ways to solve the problem. |
| This can also be done in one step:  It will travel 270 km | | In all groups will share their solutions with the rest of the class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) | | |
| Carefully choose the exercises which show different cognitive levels from Sasol-Inzalo workbooks, DBE workbooks and any textbook used in your school. The following are some of the questions that can enhance understanding of problem solving that involves ratio, rate, speed, distance and time. .   1. Write each of the following ratios in simplest form 2. 10:15 3. 6:18:24 4. 3 minutes:600 seconds      1. Choose the correct answer: A painter is paid by the hour. If he is paid R360 for 12 hours work, how much will he be paid for 9 hours work?   A R120  B R180  C R270  D R480   1. Mark travels between two towns A and B at an average speed of 70 kilometres per hour for hours. On his return from town B to A, he travelled at an average speed of 90 kilometres per hour. How long did he take on his return trip? 2. In 1996, Penny Heyns of South Africa broke the world record by completing the 100 metre breaststroke in 1 minute and 7,02 seconds. Calculate her average swimming speed in metres per second. | | |
| Sasol-Inzalo Book | DBE Workbook | Textbook |
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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. Emphasise that:  * a **ratio** is a comparison of two or more quantities of the same kind. * a rate is a comparison of two quantities of different kinds. * You must always specify the units when you write the rate. * The formula that we use to calculate speed, distance and time is:        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 workbooks, workbooks and/or textbooks for learners’ homework. The selected activities should address different cognitive levels. |