**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – October 2015**

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

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| 1. **TOPIC: COMMON FRACTIONS:** EQUIVALENT FORMS (**Lesson 1**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to** recognise equivalent forms between**:**   * common fractions (fractions where one denominator is a multiple of the other). * common fractions and decimal fraction in the forms of the same number. * common fraction, decimal fraction and percentage forms of the same number. |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * multiplication * multiples * percentages * equivalence |
| 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. | |

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| 1. **INTRODUCTION** (suggested time: 10 Minutes)   **Note:** Ask learners to orally give responses to the question below:  Consider the following figures. What fraction is the shaded part? Give answers in simplest form. | |
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| 1. What do you notice about the size of a fraction after it has been simplified? 2. What name is given to these kinds of fractions?   **Note:** Allow learners to give answers while directing them towards the expected response. | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| **Note:** Present the following to the learner by asking them questions since this is revision work.  Activity 1: Express your responses in the introduction above as a percentage and as a decimal fraction.     |  |  |  | | --- | --- | --- | | Common Fraction | Percentage | Decimal Fraction | |  |  | 0,25 | |  |  | 0,5 | |  |  | 0,75 | |  |  | 0,3 |   Activity 2: Rewrite each of the following as an equivalent fraction, with the denominator 24.   1. (answer 9) 2. (answer 10) 3. (answer 15) | * respond to the teachers’ questions. * ask questions where they seem not to understand. * copy down examples onto their exercise books. |
| Activity 3: Determine the lowest common multiple (LCM) of the denominators of :  (answer 12) |  |
| Activity 4: Rewrite the following fractions with a common denominator and then arrange the original fractions in ascending order (smallest to biggest): |
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| 1. **CLASSWORK** (Suggested time: 15 minutes) |
| 1. Determine the lowest common multiple (LCM) of the denominators of and. 2. Consider the fractions and. 3. Complete the following statement: 4. Complete the following statement: 5. Write down three common fractions bigger than , and smaller than.      1. Circle the greatest fraction; ; 2. Complete the table below:  |  |  |  | | --- | --- | --- | | Common Fraction | Percentage | Decimal Fraction | |  |  |  | |  |  |  | |  |  |  | |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that** in equivalent fractions, the value of a fraction **does not** change. 2. **Homework**   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.  Sasol – Inzalo Book 2 page 9 to 11, no 6 – 10. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

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| DATE: |  |
| DURATION: | 1 Hour |

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| 1. **TOPIC: COMMON FRACTIONS:** CALCULATIONS USING FRACTIONS AND CALCULATION TECHNIQUES (**Lesson 2**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to :**   * convert mixed numbers to common fractions in order to perform calculations with them. * use knowledge of multiples and factors in the simplest form before or after calculations * use knowledge of equivalent fractions to add and subtract common fractions * add and subtract common fractions, including mixed numbers * find fractions of whole numbers |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * converting mixed numbers to common fractions * multiples * factors * equivalent fractions * place value |
| 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)   **Activity 1**  Use 4revise the following key words done in Grade 7 and apply them in context where possible: (**Note:** First ask the learners to explain the concepts in their own words).   * *Numerator:* the whole number above the fraction bar/line. * *Denominator:* the whole number below the fraction bar/line. * *Proper fractions:* common fractions with the numerator smaller than the denominator. * *Improper fractions:* common fractions with the numerator bigger than the denominator. * *Mixed numbers:* a number comprising of a whole number and a proper fraction. * *Equivalent fractions:* fractions that have the same value.   **Activity 2**  Use ‘whole class teaching’ and ask the learners to:   1. List the multiples of 3 and 6 less than 40, and then identify the common multiples and LCM.   **Solution:**   * Multiples of 3 less than 40: 3,**6**,9,**12**,15,**18**,21,**24**,27,**30**,33,**36**,39 * Multiples of 6 less than 40: **6**,**12,18,24,30,36** * Common multiples of 3 and 6: **6; 12,18,24,30,36** * The highest common multiple is 36 * The lowest common multiple is 6  1. Write down any five different fractions that are equivalent to. 2. Arrange the following fractions in ascending order (from smallest to biggest). | | |
| ;  **Note:** Take note of how we name fractions: is two quarters and not two over four. This will also assist when you deal with place value. | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| Whole class teaching:  **Note:** present the following examples to the learners.   * explicitly refer to other sections within the Grade 8 curriculum (e.g. algebraic fractions, ratio, and percentages) where the knowledge of fraction will be needed as well as in the previous grades where common fractions are used. * use the following examples to demonstrate how the denominators can be made the same using appropriate calculation techniques. * engage the learners while doing these examples on the board.   **Example 1:** (same denominators)    1  **Example 2:** (different denominators)   1. multiples of 8   multiples of 4  LCM = 8    **Note**: we multiplied the second fraction by to get eighths.  Multiples of 5 =  Multiples of 6 =  LCM = 30 :  =    2    2  OR  )  =  =  =  = 2 | * answer probing questions presented by the teacher. * ask questions for better understanding if necessary. * copy down the examples onto their exercise books. |
| OR        2  2  **Note**: and are equivalent fractions.   1. 2   (subtract the whole numbers; subtract the numerators and the  denominator stays the same)  1  OR        1          **Note:**   * to add and subtract mixed numbers, you can work with the whole number parts and the fraction parts separately as it is done in the example above. * the fractions above (d) are the same digits but swapped around. In order to do the subtraction of mixed numbers above, we need to “borrow” a unit from 10 because we cannot subtract from.   **Example 3:** (improper fractions)  Calculate: or 3  **Note:** give them practice exercises, and analyse the emerging errors that may become misconceptions and address them immediately.   1. **CLASSWORK** (Suggested time: 15 minutes)   1. Calculate:     1. 4 2. 7 3. 8 4   2. Which improper fraction is equal to 2?  ; ; ;    3. Circle the mixed number that is equivalent to 1.  1 2; 1; 3  4. Change these mixed numbers to improper fractions or whole numbers. Reduce to lowest terms if necessary.  a) 5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  b) 22 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  c) 32 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  5. Circle a proper fraction whose numerator is a composite number.  3 ; 4 ; ;  **Note:**  if learners do not manage to finish the class work in class, allow them to do the rest of the sums for homework |  |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| **Note:** A fraction is a portion of a whole or group that has been divided into equal parts. A **common fraction** is a number written in the form . The number is a whole number called the **numerator** and is a non – zero whole number called the **denominator**. **Equivalent fractions** are fractions that have the same value. Common fractions can be divided into two groups: **proper and improper** fractions. When the numerator is smaller than the denominator, the number is called a **proper fraction**, for example,, and are proper fractions. When the numerator is larger than the denominator, the number is called an **improper fraction**, for example, and are improper fractions. Improper fractions can also be written as mixed numbers. Mixed numbers are made up of whole numbers and proper fractions.   1. **Emphasise that**:  * to add or subtract fractions, all the fractions must be expressed in the same unit .i.e. the denominators must be the same. * how to add fractions with different denominators?: * find the Lowest Common Multiple (LCM) of the fractions i.e what number can both denominators be divided into? * rename the fractions to have the LCM * add the numerators of the fractions and NOT the denominators * simplify the fraction * when simplifying a fraction, the fraction must remain equivalent to the original one. |
| 1. **Homework**   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.  Select activities from Sasol-Inzalo book 2 on page 12 to 14 and DBE workbook2 page 2 no 2 to 5. |

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| DATE: |  |
| DURATION: | 1 Hour |

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| 1. **TOPIC: COMMON FRACTIONS:** CALCULATIONS USING FRACTIONS AND CALCULATION TECHNIQUES (**Lesson 2**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to :**   * convert mixed numbers to common fractions in order to perform calculations with them. * use knowledge of multiples and factors in the simplest form before or after calculations * find fractions of whole numbers * multiply common fraction, including mixed numbers * divide whole numbers and common fractions by common fractions |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * multiplication and division of whole numbers * multiplication and division of fractions * conventional naming of fractions * addition and subtraction of whole numbers |
| 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)   The wire to make animals and cars costs six cents per metre. Complete the following table:   |  |  |  |  | | --- | --- | --- | --- | | **Length in metres** | **Cost in cents** | **Length in metres** | **Cost in cents** | | 1 | 6 | 10 |  | | 1 |  | 20 |  | |  | 12 | 30 |  | | 2 |  | 40 |  | |  | 18 | 50 |  | | 3 |  | 60 |  | | 4 |  | 70 |  | | 4 |  | 80 |  | | 5 |  | 90 |  | |  | 51 | 100 |  |   Calculate the cost of:   1. 25 metres of wire \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. 7 metres of wire \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. 85 metres of wire \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. 10 metres of wire \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 5. How did you arrive at the solution? (show all your working out)   **Note:** allow the learners to first give the answers verbally then ask them to show mathematical steps that led them to the answer. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| Whole class teaching: Present the following activities as examples. Involve learners in the presentation by asking them probing questions.  **Activity**  Without using a calculator, simplify each of the following expressions as far as possible:    2. 2 1   =  = 3   1. (i) of OR   (ii)  **Note:** dividing the numerator into the denominator and visa versa simplifies the fraction before you get to the final answer like in (ii) above. Whereas in (i) above, the final answer still needs to be simplified.    **Note**: when we divide fractions, we multiply the next fraction by its reciprocal i.e. the numerator becomes the denominator and the denominator becomes the numerator. | * respond to probing questions asked by the teacher. * ask question for better understanding if needs be. * copy down the examples onto their exercise books. |
| 1. =   =   1. 2 |  |
| 1. **CLASSWORK** (Suggested time: 15 minutes) | |
| 1. Complete the following flow diagrams:   a) 20  b) 2  2. Determine the value of each of the following expressions, given that; ; and .  Example: | |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that**:  * the fraction after the division sign is inverted only after the division sign has been changed to a multiplication sign. * the technique of ‘invert and multiply’ applies to division in general and not just to divisions by fractions. e.g. 10 5 is the same as 10 2 (multiply by the reciprocal of 5) * dividing by a number is the same as multiplying by the reciprocal of the number i.e. the reciprocal of t is . * when multiplying or dividing fractions, we do not look for the LCM. We multiply the numerator by the numerator and the denominator by the denominator. * finding a ‘fraction **of** a whole number’ or ‘finding a fraction **of** a fraction’ means multiplying the fraction and the whole number or the fraction with the fraction. * the convention of writing whole numbers as a fraction over when multiplying. * for multiplication fractions, learners should be encouraged to simplify fractions by dividing numerators and denominators by common factors. See examples above. * to multiply by a mixed number like 2 , it is good practice to express the whole number part in the same fraction units as the fraction part, for example:2 wholes is 16 eighths, so 2 is      * when simplifying a fraction, the fraction must remain equivalent to the original one.  1. **Homework**   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.  Select activities from Sasol-Inzalo book 2 on page 18 to 21 and DBE workbook 2 on page 4 no 1-4 and page 6 no 1-4. |

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**GRADE 8**

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| TEACHER’S NAME: |  |
| DATE: |  |
| DURATION: | 1 Hour |

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| 1. **TOPIC: COMMON FRACTIONS:** CALCULATIONS USING FRACTIONS AND CALCULATION TECHNIQUES (**Lesson 3**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to :**   * convert mixed numbers to common fractions in order to perform calculations with them. * use knowledge of multiples and factors in the simplest form before or after calculations * add and subtract common fractions, including mixed numbers * use knowledge of reciprocal relationships to divide common fraction * divide and multiply whole numbers and common fractions by common fractions, including mixed numbers |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * add and subtract common fractions, including whole numbers * divide and multiply common fractions, including whole numbers * place value * naming fractions * terms are separated by a ‘’ or a ‘‘ sign. * order of operations |
| 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. | |

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| 1. **INTRODUCTION** (suggested time: 10 Minutes)   **Note to the teacher:** in this lesson, learners work with expressions consisting of mixed operations on  fractions. Terms are separated by a “” or a ““sign.  Simplify:   1. 22 16 2 22 (16 2) (2 terms – separate the terms and simplify the brackets)   22 8  14   1. or any other method discussed in lesson 2. |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| Whole class teaching:  Present the following activities as examples.  **Note:** consider the following steps when simplifying fractions with multiple operations:   * Separate the terms using brackets guided by the “” and the ““ sign * simplify within the bracket * work from left to right   **Activity**  Simplify each of the following expressions as far as possible:   1. *(2 terms)*      1. 2 3        1. *(3 terms)*         +      1 | * respond to probing questions asked by the teacher. * ask questions should they not understand. * copy down examples onto their exercise books. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) |
| Simplify the following expressions as far as possible:   1. 2 2. 25 |
| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that**:  * terms are separated by a ‘’ or a ‘‘sign. * start working * once the expression has got only a ‘’ and or a ‘‘sign, the expression could be worked out from left to right.  1. **Homework**   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 level.  Sasol – Inzalo book 2 page 21 no 8. |

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| DURATION: | 1 Hour |

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| 1. **TOPIC: COMMON FRACTIONS:** CALCULATIONS USING FRACTIONS (**Lesson 4**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to** calculate the squares, cubes, square roots and cube roots of common fractions |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * squares ; cubes; square roots; and cube roots of whole numbers * area * surds * exponents * addition, subtraction, multiplication and division of fractions |
| 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. | |

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| 1. **INTRODUCTION** (suggested time: 10 Minutes)   **Note:** Present the following problems to test learners’ pre – knowledge. The following expression could be done orally by inspection (where possible) and or work it out.  Simplify each of the following expressions as far as possible:      13      6  OR 2 6   1. 2 2 2 8 2. 4 4 16 |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| 2. 11   1   1. 4           **Note:** 2          1 | * respond to probing questions asked by the teacher while presenting. * copy down the examples onto their exercise books. |
| **Note:** when adding or subtracting fractions, any method demonstrated in lesson two can be used to make the denominators the same. |  |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) |
| Simplify each of the following expressions without using a calculator: |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that**:   Squaring a number   * when we square a number, we multiply that number by itself.   We read this as “five squared equals twenty five” which means that “five multiplied by itself equals twenty five”  example: 5 5 25 and not 5 2 10. |
| Cubing a number   * when we cube a number, we multiply that number by itself twice.   We read this as “three cubed equals twenty seven” which means that “three multiplied by three multiplied by three again, equals twenty seven”  example: 3 3 3 27 and not 3 3 9  Finding the square root of a number   * when we are looking for the square root of a number, we are looking for a number that can be multiplied by itself to give the original number. This is then the reverse or inverse of “squaring”. Example: 5 we say that the “square root of twenty five is five”   Finding the cube root of a number   * when we are looking for a cube root of a number, we are looking for a number that can be multiplied by itself twice to give the original number. This is then the reverse or inverse of “cubing”. Example: 3 we say that the “ cube root of twenty seven is three”  1. **Homework**   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.  Select activities from Sasol-Inzalo book 2 on page 22 and DBE workbook 2 on page 8 no 1 to 4. |

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| 1. **TOPIC: COMMON FRACTIONS:** PERCENTAGES (**Lesson 6**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to:**   * find percentages of whole numbers * calculate the percentage of part of a whole * calculate percentage increase or decrease * calculate amounts if given percentage increase or decrease |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook, textbook | |
| 1. **PRIOR KNOWLEDGE:** | * using a calculator * common fractions * decimal fractions * percentages * equivalent fractions * rounding off | |
| 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)   **Note to the teacher:** the English word “per” translates into “divided by” in Mathematics. For example, 75% (seventy – five percent) translates into . The English word “of” translates into “multiply by” in Mathematics. For example, 70% of 400 means 400 280. Therefore; a percent is a fraction with 100 as a denominator. When we express a value as a percentage, we are equating the whole to one hundred equal parts. Allow learners to do the following activity in groups. This will serve as the baseline assessment informed by what they have learnt in the previous grade.   1. Fill in the table below without using a calculator. Calculators may be used ONLY in number 4:  |  |  |  | | --- | --- | --- | | Common fraction | Percentage | Decimal fraction | |  | **50%** | **0,5** | |  | **25%** | **0,25** | |  | **75%** | **0,75** | |  | **60%** | **0,60** |   **Note:** encourage learners to familiarise themselves with the equivalent fraction and decimal forms of the above common percentages.   1. Calculate 60% of R105   R105 R63 | | |
| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | | |
| **Teaching activities** | | **Learning activities**  **(Learners are expected to :)** |
| Whole class teaching: Present the following activities as examples.  **Activity**   1. A novel was marked at R 120, but the store manager offered Lesedi a discount of 25 percent. Calculate the discount in rands.   25 percent of R 120 translates into: R 30  the discount is R 30   1. A box of chocolate was marked at R 180, but the store manager offered Mark a discount of 20 percent. Calculate the discounted price in rands.   1st approach:  20 percent of R 180 translates into: × R 36  Discounted price: R 180 R 36 R 144  2nd approach:  The store manager is subtracting 20 percent from the price.  20 percent translates into (or 20 of every hundred)  100 20 80  The discount price will be 80 percent of R 180.  the discounted price : R 144 | | * respond to questions asked by the teacher during the presentation. * copy down the examples from the board onto their exercise books. |
| 1. At the beginning of the New Year, a clothing store is going to increase the price of all its stock by 15 percent. Calculate the new price of a T – shirt, which currently costs R 120.   1st approach:  15 percent of R 120 translates into: R 18  New price: R 120 R 18 R 138  2nd approach:  The store manager is adding 15 percent to the price.  15 percent translates into (or 15 of every hundred).  100 15 115  The new price will be 115 percent of R 120.  New price: R 138   1. At a local high school, 96 grade 8 learners passed Mathematics in 2013. In 2014, 120 grade 8 learners passed Mathematics. 2. Express the increase in the number of passes as a percentage of the number of grade 8’s in 2013.   Increase: 120 96 24  25%  Increase: 25% **of** 96   1. Express the decrease in the number of passes as a percentage of a number of grade 8’s in 2014.   Decrease: 120 96 24  20%  Decrease: 20% **of** 120  **Note:** where two approaches in the examples above are presented, present both of them (or more, if applicable) but allow learners to choose the one they prefer to use. The choice may differ from one learner to the other. | |  |
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| 1. **CLASSWORK** (Suggested time: 15 minutes) |
| Calculate the following:   1. Express each of the following test results as a percentage, and then arrange them from lowest to highest: 2. 9 out of 20 3. 11 out of 25 4. 21 out of 50 5. Express each of the following test results as a percentage (rounded off to one decimal place), and then arrange them from lowest to highest. 6. 17 out of 25 7. 27 out of 40 8. 50 out of 75 9. What percentage is 40c of R3, 20? 10. Calculate the percentage increase if the price of a bus ticket of R 60 is increased to R 84. 11. Calculate the percentage decrease if the price of petrol goes down from 20 cents a litre to 18 cents a litre. 12. Calculate how much a car will cost if its original price of R 150 000 is reduced by 15%. |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that**:  * when doing calculations using percentages, equivalent fraction form, which is a fraction with a denominator of a 100, should be used. * learners familiarise themselves with the equivalent fraction and decimal forms of common fractions. (see introduction).  1. **Homework**   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.  Sasol- Inzalo book 2 on page 16 no 7 and DBE workbook 2 on page 10 no 1 to 6. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – October 2015**

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

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| 1. **TOPIC: COMMON FRACTIONS:** SOLVING PROBLEMS (**Lesson 7**) |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED**   **By the end of the lesson learners should know and be able to:**   * solve problems in contexts involving common fractions and mixed numbers, including grouping, sharing and finding fractions of the whole numbers * solve problems in contexts involving percentages |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook, textbook |
| 1. **PRIOR KNOWLEDGE:** | * squares and square roots * addition ;subtraction ; multiplication and division of fractions * percentages * rounding off * mathematical language – difference; product; sum; quotient |
| 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)   **Note:** provide the learners with the following statement for them to complete. Learners may work in groups.  Rewrite each of the following statements using numbers and mathematical symbols:   1. Half of a quarter equals one-eighth ……………………………………………………. 2. The square root of one-ninth is equal to one-third …………………………………. 3. The difference between a third and a quarter is equal to one-twelfth………………… 4. The product of a third and a quarter is equal to one-twelfth…………………………… 5. The difference between a cube of one-half and the square   of one – third is equal to ………………………………………………………………….   1. The quotient of one half and one quarter is equal to two ……………………………….. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  **(Learners are expected to :)** |
| 1. Write down two common fractions bigger than , and smaller than .   ; (or any other)   1. Bingo and Mary have 1 bars of chocolate. They want to share the chocolate equally. How much chocolate must each child get?   1 2    =   1. A jug is filled with water. Two-fifths of the water is removed from the jug. Of the remaining water, two – thirds is then removed from the jug. What fraction of the original water is left in the jug?   left   1. Half of a certain number equals one-fifth of 20. Determine the number.   the number is 8 | * Respond to questions asked by the teachers during the presentation of the lesson. * Ask questions for clarity purposes if there is a need. * Copy down examples onto their exercise books. |
| 1. In a particular school there are 900 learners. Three-fifths of the learners are boys. Three- quarters of the boys are boarders. How many boys are boarders?   boys  540 = 405 boys are boarders   1. On a shopping trip, you notice that one of your favourite stores is having a sale. 2. Determine the sale price of an item marked down by 20%, if the normal price is R 120.   R 24  sale price is R 120 – R 24 R 96   1. Determine the percentage discount offered on an item with a sale price of R 136, if the normal price is R 160.   R 136 R 160 R 24  15  the percentage discount is 15%   1. I think of a certain number. If I square it, double this value and then multiply the answer by 18, the result is 4. Determine the number. |  |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) |
| FRAC15Calculate the following:  **Birthday Cake**   1. Lisa uses the juice of 1 oranges for a large birthday cake. She has 8 oranges. How many cakes can she bake? 2. The children are making different animals and cars from wire.   A car needs 2 metres of wire. They can sell a car for R30.  An animal needs 1 metres of wire. They can sell an animal for R20. |
| 1. The children have 20 metres of wire. 2. How many cars can they make from 20 metres of wire? 3. How many animals can they make from 20 metres of wire? 4. Look at the two answers you get for question 1. Look at the selling prices for the cars and the animals.   Now help the children to decide what they must make, cars or animals, to earn the most money.   1. Half of the square root of a certain number equals one quarter. Determine the number. |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK** (Suggested time: 5 minutes) |
| 1. **Emphasise that**:  * write down all the information given so as to make sense of the problem. * learners familiarise themselves with mathematical language.  1. **Homework**   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.  Sasol-Inzalo Book 2 on page 18 to 28 and DBE Workbook on page 14 no 1 to 2. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: DECIMAL FRACTIONS:** ORDERING AND COMPARING DECIMAL   FRACTIONS **(Lesson 1)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to do:**   * ordering, comparing and place value of decimal fractions to at least 3 decimal places * rounding off decimal fractions to at least 2 decimal places. |

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| 1. **RESOURCES:** | Sasol-Inzalo Book 2, DBE Workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Ordering, counting and comparing decimal fractions 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)   Revise the counting, ordering and comparing of decimal fractions by using the following activities:  **Activity 1**  Write down threedifferent numbers that are bigger than the first number and smaller than the second number.  (a) 5,1 and 5,11  (b) 5,11 and 5,12  Solutions  (a) 5,103 ; 5,106 ; 5,109 (Any other numbers greater than 5,1 but less than 5,11)  (b) 5,115 ; 5,130 ; 5,145 (Any other numbers greater than 5,1 but less than 5,11)  **Activity 2**  Underline the bigger of the two numbers.   1. 2,399 and 2,60 2. 5,604 and 5,640 3. 0,111 and 0,087   Solutions   1. 2,399 and 2,60 2. 5,604 and 5,640 3. 0,111 and 0,087 | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present ALL the worked examples and let learners do ALL activities in small groups.  **Worked example 1**  Write down the values of the points marked A to D using decimal fractions.    Solutions   1. 14,2 B. 14,5 C. 14,6 D. 14,9   **Activity 1**  Write down the values of the points marked A to D using decimal fractions.    **Worked example 2**  Order the following numbers from smallest to biggest.  0,8 0,05 0,901 0,15 0,465 0,55 0,75 0,4 0,62  Solution  0,05; 0,15; 0,4; 0,465; 0,55; 0,62; 0,75; 0,8; 0,901  **Activity 2**  Order the following numbers from biggest to smallest.  6,353 6,342 6,356 6,342 6,351 6,346 6,443 6,501  **Worked example 3**  Replace the \* in the following statements by using ˂ , ˃ or = to make each of them correct.  a) 3,90 \* 3,09 b) 3,9 \* 3,90 c) 2,31 \* 3,21  **Activity 3**  Replace the □ in the following statements by using ˂ , ˃ or = to make each of them correct.  a) 8,08 □ 8,080 b) 8,080 □ 8,008 c) 10,012 □ 10,120 | Write down the solutions for the worked examples.  Work out the solutions for all activities in small groups. |
| **Worked example 4**  Write down the place value of each digit in words for 3,378  Solution  3 units + 3 tenths + 7 hundredths + 8 thousandths  **Activity 4**  Write down the place value of each digit in words for 2,588  **Worked example 5**  Write down the value of the underlined digit in 4,37  Solution: 0,07 or 7 hundredths  **Activity 5**  What is the value of 3 in the decimal fraction 3,809?  **Worked example 6**  Round off the following to 2 decimal places/ nearest hundredths.  a) 1,181 b) 5,229  Solutions  a) 1,18 b) 5,23    **Activity 6**  Round off the following to 2 decimal places.  a) 2,345 b) 5,9676 |  |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   DBE workbook 2, p18 no. 2 (d) – (f), p19 no. 5 (d) – (f) and no. 6 (d) – (f). |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * the place value of the digit is the value that a digit has due to its position in a number system. * rounding off a decimal number is either the number is rounded up or rounded down depending   on the required decimal places.  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.  **Homework:**  DBE workbook 2   1. p19 no. 3 2. p21 no. 5(f) – (h) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: DECIMAL FRACTIONS:**CALCULATIONS WITH DECEMAL FRACTIONS **(Lesson 2)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to:**   * add, subtract and multiply decimal fraction to at least 3 decimal places. * Divide decimal fractions by whole numbers. * extend multiplication to ‘multiplication by decimal fractions’ not limited to one decimal place. * extend division to ‘division of decimal fractions’ by decimal fractions’. |

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| 1. **RESOURCES:** | Sasol-Inzalo Book 2, DBE Workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Calculations with decimal fractions 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)   Let learners do the following activities individually.    **Activity 1**  We use decimal numbers in our daily activities. Name and explain at least three activities   that involve the use decimal numbers.  Possible answers:  In financial matters, measuring lengths (distances), health measuring equipment, calculating   motions (e.g. speed), etc.    **Activity 2**  Calculate (without using calculators).   1. R26,15 + R14,55 2. 45,67 – 23,25 3. 0,5 x 10 4. 0,8 ÷ 4 | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Let learners work on the following activity in small groups. Constantly monitor the groups’ activities until they report back to the whole class.  **Activity**   1. Calculate.   2,15 + 8,21 – 7,21   1. Mpho and John recorded the following experimental results (in cm) for their mathematics investigation.   78,9; 57,8; 34,2; 88; 56,8; 55,4; 67,6; 45,5; 34,5; 64,5  They calculated the sum individually. Mpho’s sum is 582,5 (≈ 583cm) and John’s sum is 583,3 (≈ 583cm).   1. Calculate the sum and round off to the nearest whole number. 2. Whose sum (Mpho or John) is closer to the actual sum and explain why? 3. Calculate the value of: 4. 0,2 x 0,3 5. 0,12 x 0,03 6. 5,4 ÷ 0,6 7. 12,55 ÷ 0,5   **Solutions**   1. 2,15 + 8,21 – 7,21   = (2 + 8 – 7) + (0,1 + 0,2 – 0,2) + (0,05 + 0,01 – 0,01)  = (3 + 0,1 + 0,05)  = 3,15   1. a) Sum = 583,2cm ≈ 583cm   b) John, total error is less than 0,5   1. a) 0,2 x **10** x 0,3 x **10**   = 2 x 3  = 6 ÷ **10** ÷ **10**  = 0,06  b) 0,12 x **100** x 0,03 x **100**  = 12 x 3  = 36÷ **100** ÷ **100**  = 0,0036   1. (5,4 x10) ÷ (0,6x10)   = 54 ÷ 6  = 9   1. (12,55 x 100 ÷ 0,5 x 100)   = 1255 ÷50  = 25,1 | Work out the solutions for all activities in small groups and present to the class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   DBE workbook 2, p24 no. 1 (b) – (d), no. 2 (d) – (e) and p26 no. 3 (c) – (e). |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * when multiplying decimal fractions, convert fractions to whole numbers by multiplying by powers   of 10 (e.g. 0,04 x **100** = 4). Do calculations using whole numbers then revert to decimal fraction   by diving with the powers of 10 (same powers of 10 previously used to convert to whole   numbers). * when dividing decimal fractions, one may multiply **both** the dividend and divisor by the **same**   multiples of 10. * when having more than one operations to perform in the expression, apply the BODMAS rule.  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.  **Homework:**   1. Sasol-Inzalo Book 2; p39 no. 9 (a) – (f) 2. DBE workbook 2; p26 no. 5 (a). |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: DECIMAL FRACTIONS:** CALCULATIONS WITH DECIMAL FRACTIONS **(Lesson 3)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to calculate the square, cubes, square roots and cube roots of decimal fractions.** |

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| 1. **RESOURCES:** | DBE workbook 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | Fractions, squares, cubes, square roots and cube roots of whole numbers |
| 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)   Present the following activity to learners as a baseline assessment. Learners must do the   activity individually.    **Activity**  Determine the value of:   1. 42 2. (0,4)2 3. (0,04)2 4. (0,1)3 | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Do worked examples and let learners work in small groups on activities. Allow some groups to report back their solutions to whole class.  **Worked examples**  Calculate   1. (0,6)2 2. (0,13)2 3. (0,02)3   Solutions   1. (0,6)2   =0,6 x 0,6  = 0,36   1. (0,13)2   =0,13 x 0,13  = 0,0169  = OR =  = = 0,6  = 0,6   1. (0,02)3   =(0,02) x (0,02) x (0,02)  = 0,000008  = OR =  = = 0,3  = 0,3  **Activity**  Evaluate  a) (0,3)2  b)  c) (0,4)3  d) | Work out the solutions for all activity in small groups and present to the class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   DBE workbook 2, p29 no. 2 (d) – (f) and p30 no. 4 (d) – (f) |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * for square and cube roots calculations, learners may first convert the decimal fraction into   common fraction by multiplying with multiples of 10. Find the square or cube root of both the   numerator and denominator. Convert back to decimal fraction.  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.  **Homework:**  DBE workbook 2; p31 no. 7 (a) – (c) and no. 8 (a) – (c). |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: DECIMAL FRACTIONS:** SOLVING PROBLEMS **(Lesson 4)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to solve problems in context involving decimal fractions.** |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo Book 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | Addition, subtraction, multiplication of decimal fractions and mixed numbers |
| 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)   Present the following activity to learners and ask questions to guide them to find   solutions.  **Activity**     1. Tebogo buys 3,5kg of fruits at R56,37 per kilogram, how much does she pay for the  fruits?   Estimation: 56,37 x 3,5 ≈ 60 x 4 ≈ 240  The actual amount is: 56,37 x 3.5 = R197,295  Tebogo pays R197,295   1. Hillary works for 7,30 hours and is paid R204,15 for the shift. What is her hourly rate of pay?   Estimation:  ≈ 25  The actual amount is:  Tebogo pays R27,97 per hour | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Let learners work in small groups on activity below. Allow some groups to report back their solutions to whole class. Discuss all solutions with the class.  **Activity**   1. Determine the value of . 2. + 5,2 = 7 3. 3,5 = 6 4. 0,32 ÷ = 8      1. The difference between two numbers is 0,85. If the bigger number is 22,8; what is the other number? 2. Three passengers are seated in the car having masses of 67,8 kg; 79,3 kg and 102,4 kg. 3. Estimate the total mass of the passengers. 4. Calculate the total mass of the passengers.   A  A   1. Eight (8) farm workers are paid a total of R2 045, 80 per week. 2. Estimate the amount one farm worker earns per week. 3. How much does one farm worker earn per week? 4. What is the total monthly pay bill of the farmer?   **Solutions**   1. a) + 5,2 = 7   + 5,2 – 5,2 = 7,0 - 5,2  = 1,8  b) 3,5 x = 10,5  3,5 x x = 10,5 x  = x  =  = 3   1. 0,32 ÷ = 8   x | Work out the solutions for all activity in small groups and some groups present their solutions to the class. |
| 1. Let the other number be   Bigger number – difference =  22,8 – 0,85 =  21,95 =   1. a) 68 + 79 + 102 = 249 kg 2. 67,8kg + 79,3 kg + 102,4 kg = 249,5 kg 3. a) 2 050 ÷ 10 = R205   b) R2 045, 80 ÷ 8 = R255, 73 per farm worker  c) R2 045, 80 x 4 = R8 183, 20 is the monthly pay bill |  |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Activity   1. Agnes wants to make 12 cushions from 6,75 metres of fabric. 2. Estimate how much fabric will she have for each cushion. 3. How much fabric will she have for each cushion?   Give your answer to 3 decimal places.   1. If it costs R18,25 per meter for the fabric, how much Agnes pays for 6,75 m of fabric? Give your answer to the nearest cent. 2. Sasol-Inzalo workbook 2, p 40 number 1 and 2. |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners need to apply different mathematical skills to solve problems associated with decimal fractions. * learners must be able to estimate the answers to a given problem and calculate the answer. Answers may also be verified using scientific calculators or by substitution if presented in equation form.  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.  **Homework:**  Sasol-Inzalo workbook 2, p 40 number 3 and 4. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: DECIMAL FRACTIONS:**EQUIVALENT FORMS **(Lesson 5)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to do equivalent forms between common fraction, decimal fraction and percentage forms of the same number.** |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo Book 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | Equivalence forms done in fractions. |
| 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)   **Activity**   1. Convert the common fractions to decimal fractions correct to 2 decimal places. 2. b) 3. Convert decimal fractions to common fractions 4. 1.6 b) 0.04 5. Express 80 hundredths as percentage. 6. What is the fraction of the darkened parts (cells) in rectangle below? Give your answer in fraction notation and decimal notation.        1. What would be the percentages of the darkened parts (cells) in question 4 above? | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Let learners work in small groups on the activity below. Allow some groups to report back their solutions to whole class. Discuss all solutions with the class.  **Activity**   1. Complete the following table.  |  |  |  | | --- | --- | --- | | **Common fraction** | **Decimal fraction** | **Percentage** | |  | 0,3 |  | |  |  |  | |  |  | 15% | |  |  |  | |  | 0.37 |  | |  |  | 12,5% |      1. Write the following as decimal fractions and also express the answers in percentages. 2. 7 x 3. 2 x 10 + 1 x 1 + 4. 2 + 3 tenths + 17 hundredths | Work out the solutions for all activity in small groups and some groups present their solutions to the class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Sasol-Inzalo workbook 2, p32 no. 5 and p33 no. 6 (c) and (d). |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * decimal fractions and common fractions are two different ways of expressing the same number. We can interchange between decimal and common fractions. * percentage is decimal and/or common fraction expressed as a hundredths.  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.  **Homework:**  DBE workbook 2, p22 no. 1(a) – (f) and p23 no. 4 (a) to (e) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: THE THEOREM OF PYTHAGORAS :** DEVELOP AND USE THE THEOREM OF PYTHAGORAS **(Lesson 1)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Investigate the relationship between the lengths of the sides of a right-angled triangle to develop the Theorem of Pythagoras. |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo Workbook and textbook. |
| 1. **PRIOR KNOWLEDGE:** | * squares and square roots * area * surds * triangles |
| 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)   Revise different types of triangles with learners  A  a  B  B  A  A  b  C  c  c  b  b  C  a  c  B  C  a    Figure 3  Figure 1  Figure 2    Ask learners to :   * Give the properties of each figure * Name each figure   **NB:** Ask learners what they remember about these triangles. Let learners name the triangles according to their angles. Indicate the following important facts:   * If the vertices of a triangle are labelled A, B and C, the sides opposite these vertices are often labelled as a, b and c, as shown in the above diagrams. * We use the hypotenuse to indicate the side opposite the 90° angle of a right angled triangle. * The hypotenuse is always the longest side of a right-angled triangle.   . | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT**(Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| The teacher presents the following activity for learners to work in pairs.  **Activity 1**  Study the figures below.  Each triangle in the following figures has a square drawn on each of its sides. In figure 1, a= 3 units, b= 4 units and c= 5 units long.  **NB**:   * Relate the dimensions given to figure 1 in terms of the squares. * Prepare this activity as a worksheet.       **Figure 1** **Figure 2** |  |
| **Figure 3** **Figure 4** | work in pairs to complete the table |
| **Note to the teacher:** Guide learners to complete the table below based on the diagrams above. Complete the first row on the table in a whole class discussion and then allow learners in their pairs to do the rest.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Figure** | **Type of triangle** | **Length of side**  **a** | **Length of side**  **b** | **Length of side**  **c** |  |  |  | | 1 |  |  |  |  |  |  |  | | 2 |  |  |  |  |  |  |  | | 3 |  |  |  |  |  |  |  | | 4 |  |  |  |  |  |  |  |   **Activity 2**  **Note to the teacher:** Allow learners to use information from the table above to complete statements by inserting =, . Facilitate a whole class discussion where learners discuss their observation. Allow them to use their own words.  when ABC is an acute-angled triangle  when ABC is obtuse angled triangle  when ABC is a right-angled triangle.  **Activity 3**  **NB:** Let learners respond to the four questions that follow. These questions will be helpful in consolidating learner’s observations and discussions in activity 2.  Which of these statements below are correct?  A. In any right-angled triangle, the area of the square on the hypotenuse  is equal to the sum of the areas of the squares on the other two  sides.  B. If a triangle is acute-angled, then the square of the length of the  longest side is equal to the sum of the squares of the lengths o  f the other two sides.  C. If a triangle is right-angled, then the square of the length of the  hypotenuse equal to the sum of the squares of the lengths of the  other two sides.  D. In Any obtuse angled triangle, the area of the square on the longest  Side is equal to the sum of the area on the other two sides.  **NB :** Refer to one of the right angled triangle to consolidate learners observations as follows :    Indicate to learners that the two correct answers from activity 3 i.e A and C can be re-represented in the form of an equation as    Consolidate the activity with learners. Emphasise that the special relationship between the lengths of the sides of a right-angled triangle is known as the **Theorem of Pythagoras.** It can be statedin terms of area as follows:  If a triangle has a right angle, then the area of the square with a side on the hypotenuse is equal to the sum of the areas of the squares on the other two sides.  The reference to area can be left out  If a triangle is a right-angled triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides. | Discuss what they observe in the class.  respond to activity 3 questions |

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| 1. **CLASSWORK**(Suggested time: 15 minutes)   **Answer questions that follow**  Write down the letter that represents the hypotenuse in each triangle.  Write a Pythagorean equation for each of the following triangles. |

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| 1. **CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * The theorem of Pythagoras is used to find the third side in any right-angled triangle. * In a right-angled triangle, the largest angle is 90°. Therefore, the longest side is always opposite   the right angle. This is called the **hypotenuse.**   * A triangle with no right angle does not have a hypotenuse  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. |
| **Homework:**  The following table gives the side lengths a, b and c of 8 triangles. Complete the table to decide what type of triangle each triangle is (acute-angled or right-angled).   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  | Fill in | Type of triangle | | 6 | 8 | 10 |  |  |  |  | | 8 | 13 | 17 |  |  |  |  | | 3 | 4 | 5 |  |  |  |  | | 5 | 6 | 7 |  |  |  |  | | 5 | 12 | 13 |  |  |  |  | | 15 | 8 | 17 |  |  |  |  | | 11 | 60 | 61 |  |  |  |  | | 12 | 35 | 37 |  |  |  |  | |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: THE THEOREM OF PYTHAGORAS:** DEVELOP AND USE THE THEOREM OF PYTHAGORAS **(Lesson 2)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Determine whether a triangle is a right-angled triangle or not if the length of the three sides of the triangle are known. |

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| 1. **RESOURCES:** | DBE Workbook, Sasol-Inzalo workbook, textbook. |
| 1. **PRIOR KNOWLEDGE:** | * squares and square roots * Theorem of Pythagoras |
| 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)   Begin the lesson by asking the following questions based on the triangle below:   * Which letter represents the hypotenuse in the triangle? * Write down the Pythagorean equation of the triangle above. | |

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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 the learners  **Activity 1**  The following table gives the side lengths a, b and c of 9 triangles.  Complete the table to decide what type of triangle is (acute-angled, obtuse-angled or right-angled).  **NB**. Do the first two examples with learners as a guide on the board.  Put a table correct table, Check page 48 Sasol inzalo for TABLE    **NB**: If time allows learners may be given a chance to construct triangle which is not right-angled triangle. | Complete the activities |
| **Activity 2**  Determine whether or not the following triangle is right -angled:   1. 9; 7 and 12     **NB:** Encourage learners to: |  |
| * make a rough sketch of the triangle if not sketched for them so that they may easily understand. * draw in pencil and use rulers so that their work looks neat. * Learners should be guided by the fact that the longest side should be the hypotenuse. |  |

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| 1. **CLASSWORK**(Suggested time: 15 minutes) |
| **Activity**  Two areas of the square below are given. Calculate the area of the square that is not given and the lengths of all sides. |

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| 1. **CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * Theorem of Pythagoras is used to find the third side in any right – angled triangle * In a right – angled triangle, the largest angle is. Therefore, the longest side is always opposite the right angle. This side is called the **hypotenuse.** |
| 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. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3 : July – September 2015**

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

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| 1. **TOPIC: THE THEOREM OF PYTHAGORAS:** DEVELOP AND USE THE THEOREM OF PYTHAGORAS **(Lesson 3).** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Use the theorem of Pythagoras to calculate the missing length in a right angled-triangle, leaving irrational answers in surd form. |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook, DBE Workbook, textbook. |
| 1. **PRIOR KNOWLEDGE:** | * surds * .Theorem of Pythagoras * Squares and square roots |
| 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) 2. Ask learners the following   Simplify :     3. State the Theorem of Pythagoras   **NB**: Explain to the learners that some numbers involving roots such as , cannot be  expressed in the form of a fraction. When a square root cannot be simplified, it is called a surd.  In the examples above and are surds. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT**(Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Do the following example with learners  Calculate the length of AC. Leave your answers in surd form if necessary.    **Solution**  = + (  =  =  AC = 5 cm  **NB** : Allow learners to work out the following examples in their small groups  2.    3. | Do the example with the educator |

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| 1. **CLASSWORK**(Suggested time: 15 minutes) |
| **Activity**  Find the length of the unknown side in the following right-angled triangles. |

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| 1. **CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**: 2. 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.  **Homework:**  Sasol-Inzalo Workbook page 49 number 3, 4 and 5. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: THE THEOREM OF PYTHAGORAS:** CALCULATING THE LENGHTH OF ANY SIDE IN A RIGHT-ANGLED TRIANGLE. **(Lesson 4)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Use the Theorem of Pythagoras to calculate a missing length in a right-angled triangle, leaving irrational answers in surd form. |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook, DBE Workbook, textbook. |
| 1. **PRIOR KNOWLEDGE:** | * The Theorem of Pythagoras * Surds * Squares and square roots |
| 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)   Let learners do the following activity      Write a Pythagoras equation for the triangle above. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT**(Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Use the example in the introductory phase of the lesson to guide learners in calculating the missing side of the triangle.    **Solution :**  =  - =    = | Complete the activity with the guidance of the teacher. |
| Allow learners to work in their pairs or small groups to complete this activity.  **Activity 2**  Calculate the missing length in the following triangle. Do not use a calculator and leave your answer in the simplest surd form if necessary.  2.    **3.** |  |

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| 1. **CLASSWORK**(Suggested time: 15 minutes) |
| Calculate the missing length in the following triangle. Do not use a calculator and leave your answer in the simplest surd form if necessary. |

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| 1. **CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * It is not always necessary to make the unknown side the subject of the formula.  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.  **Homework**  Sasol-Inzalo Workbook, Page 50 number 1-3. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: AREA AND PERIMETER OF 2D SHAPES (Lesson 1)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**  Use appropriate formulae to calculate the perimeter and area of:  - squares  - rectangles  - triangles |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo workbook 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | * formulae for area and perimeter of polygons done in grade 7 * properties on 2D shapes * equations * substitution |
| 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)   Activity 1: Revise with learners the following work done in Grade 8 by asking them to:   * define: * Perimeter of a polygon: The sum of lengths of its sides or the distance along the sides of a shape. * Area of a polygon: The amount of space covered by the polygon or the size of the flat surface enclosed by the polygon. * list the properties of the following polygons: square and a rectangle.   Activity 2: Each square on the grid below measures. How many square  units make up the area of the following shapes.     * The area of each shape in square units is as shown below   A B C D E F   * The area of each shape above could be calculated by using the formulae below:   Square: and  Rectangle: and  Activity 3: Use the triangle below to revise the formulae for calculating the area of a triangle.    Area of JKL  **Note:** To calculate the area of a triangle with the above formula, the height with respect to the  chosen base must be used. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Activity: Worked examples  Example 1: If a square has a length of , calculate:   1. the perimeter and 2. the area of the square.   Solutions:       Example 2: If the perimeter of a square is :   1. Determine the length of each side. 2. Calculate the area of the square.   Solutions:    (each side is      Example 3: The area of a rectangle is and its length is.   1. Calculate the breadth of the rectangle. 2. Calculate the perimeter of the rectangle.   Solutions:                  Example 4: Consider the following triangle:     1. Calculate the perimeter. 2. Calculate the area.   Solutions: | actively engaged during lesson presentation by answering questions.  do example 2 as an activity, and discuss their solutions with the whole class. |
| 1. **CLASSWORK** (Suggested time: 15 minutes)   DBE workbook 2: page 43 no. 1 (c) and 2 (c), page 47 no. 1 (c) and (b),  page 48 no. 1 (b) and (d) | |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners should know and be able to use the formulae to calculate the area and perimeter of   squares, rectangles and triangles.   * the use of formulae provides a context to practice solving equations by inspection or using   additive inverses.   * the height of a triangle is a line segment drawn from any vertex perpendicular to the opposite   side.   * learners should know the properties of polygons in order to understand the formulae.  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.  **Homework:**  Sasol-Inzalo workbook 2 page 56 no. 5 and 6, page 58 no. 3, 5 and 6, page 59 no. 2 (a) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

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

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| 1. **TOPIC: AREA AND PERIMETER OF 2D SHAPES: (Lesson 2)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to** calculate the area of polygons to at least 2 decimal places, by decomposing them into rectangles and/or triangles. |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo workbook 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | * area of polygons * properties of 2D shapes * Theorem of Pythagoras * substitution |
| 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)   Present the following activity to learners in order to explain the meaning of a composite shape.  Activity: Consider the shape below:  4 cm  9 cm  6 cm  NOTE:   * The above shape is made up of two polygons, a rectangle and a triangle. * Shapes which are made up of two or more polygons are called composite shape. * We often break up a composite shape into rectangles, squares or rectangles to work out the area of the shapes. * To calculate the area of the composite shape given above, we must first break up the shape into a rectangle and a triangle as shown below:   6 cm  4 cm  4 cm  3 cm     * Learners should clearly indicate the dimensions of each polygon. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present the following examples to learners:   1. Calculate the area of the shape below.   4 cm  9 cm  6 cm  SOLUTION:  Area of the shape Area of the rectangle Area of the triangle           1. Consider the shape below:        1. Calculate the length of . 2. Calculate the length of 3. Hence, calculate the area of the above shape. Round off your answers to two decimal places.   SOLUTION:    a) b)        c) Area | name the polygons which comprise the shape in the introduction and their dimensions.  be actively engaged during the lesson presentation by answering questions.  indicate the dimensions of the sides needed to calculate  apply the theorem of Pythagoras. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   **Sasol-Inzalo workbook 2 page 60 no. 2 (b)** |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners must use the properties of polygons to find the dimensions of the unknown sides in   each polygon.   * learners must decompose or break up the shape into rectangles, squares and/or triangles. * learners must indicate the units of the dimensions  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.  **Homework:**  Sasol-Inzalo workbook 2 page 60 no. 2 (c) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: AREA AND PERIMETER OF 2D SHAPES:** CALCULATIONS AND |

SOLVING PROBLEMS **(Lesson 3)**

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Use and describe the meaning of the irrational number Pi () in calculations involving circles * Use and convert between appropriate SI units, including: |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo workbook 2, textbook, ruler, string |
| 1. **PRIOR KNOWLEDGE:** | * SI units * using a ruler to measure * parts of a circle * substitution * count in decimals |
| 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)   Present the following activities to learners:  Activity 1: Demonstrate (using circle A below) to learners how to measure the circumference  and diameter of a circle using a string and a ruler.        Activity 2: Let learners measure the circumference and diameter of circles B and C to verify  the measurement on the completed table.    Activity 3: Let learners use a calculator to work out the answers in the last of the table below.  (round off to two decimal places)   |  |  |  |  | | --- | --- | --- | --- | | **Circle** | **Diameter ()** | **Circumference ()** | **Circumference diameter** | | A | 5 | 15,71 | 3,14 | | B | 3 | 9,42 | 3,14 | | C | 2,5 | 7,85 | 3,14 |   **Note:**   * The circumference of any circle divided by its diameter is equal to 3,14 accurate to two decimal places. * This number is a constant value and is called pi (a Greek letter and its symbol is * is an irrational number. | |

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| * When we use in our calculations, we usually round it off as * Circumference of a circle ()   Activity 4: Conversion between appropriate SI units   * then * then * then   **Note:** Learners should use a ruler and a meter stick to verify that and |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present examples 1 and 3 to learners, and let learners do no. 2 and 4 as an activity. (Use )   1. Calculate the circumference of the circle with : 2. a diameter of 3. a radius of   Solutions:   1. Calculate the radius of a circle with a circumference of   Solution:         1. Convert: 2. to 3. to   Solutions:   1. Covert: 2. to 3. to   Solutions:  **Note**:   * To convert bigger units to smaller units, multiply by the powers of 10. * To convert smaller units to bigger units, divide by the powers of 10. | be actively involved during the lesson presentation  do no. 2 and 4 as activities, and discuss their solution with the whole class |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Sasol-Inzalo workbook 2 page 64 no. 1 (a) and (c), page 70 no. 2 and 5 |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners should always convert between units as shown on the table below:  |  |  |  |  | | --- | --- | --- | --- | | **To convert** | **Do this** | **To convert** | **Do this** | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  |        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.  **Homework:**  Sasol-Inzalo workbook 2 page 70 no. 7 and page 64 no. 2 (a) and (b), 3 (a) and (b) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: AREA AND PERIMETER OF 2D SHAPES:** AREA AND PERIMETER |

**(Lesson 4)**

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Use appropriate formulae to calculate perimeter and area of circles * Use and describe the relationship between radius, diameter and circumference of a circle in calculations * Use and describe the relationship between the radius and area of a circle in calculations |

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| 1. **RESOURCES:** | DBE workbook 2, Sasol-Inzalo workbook 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | * parts of a circle done in grade 7 * substitution |
| 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)   Revise the work done in Grade 7 and let learners explain the meaning of the words in bold below:   * The **circumference**  is the distance around the circle. It is the length of the curved line that forms the circle. * The **centre** of a circle is the point in the middle (centre) of the circle. * The **radius** (r) is the line segment drawn from the centre to any point on the circle. * **Diameter** (d) is the line segment passing through the centre of the circle and joining any   two points on the circle.  Ask learners to name parts of the circle.  **Note**: Emphasise the following:   * and * Circumference of a circle = * Area of a circle (A) = | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present the following examples 1 and 2, and let learners do no. 3 as an activity. (Use )   1. Calculate: (round off answer to two decimal places in each case)     9   1. the circumference (perimeter) of the circle. 2. area of the circle   Solutions:           1. A          1. Calculate the radius of the circle with a circumference of (round off answer to two decimal places)   Solution:        3. Calculate the radius of a circle with an area of 100.  (round off answer to two decimal places)  Solution: | be actively involved during the lesson presentation.  do no. 3 in groups, and then discuss their solutions with the whole class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Sasol-Inzalo workbook 2 page 69 no. 1 (a) and no. 2 (b) |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners should know the formulae and know how to use them. * When using the formulae, they should substitute correctly and understand the exponent on  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.  **Homework:**  Sasol-Inzalo workbook 2 page 69 no. 1 (b) and 2 (a)  DBE workbook 2 page 50 no. 1 (a) and (f) and no. 2 (a) and (d) and 3(a) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: July – September 2015**

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

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| 1. **TOPIC: AREA AND PERIMETER OF 2D SHAPES:** CALCULATIONS AND |

SOLVONG PROBLEMS **(Lesson 5)**

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to**   * Solve problems, with or without a calculator, involving perimeter and area of polygons and circles * Calculate to at least 2 decimal places |

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| 1. **RESOURCES:** | DBE workbook, Sasol-Inzalo workbook 2, textbook |
| 1. **PRIOR KNOWLEDGE:** | * Formulae of polygons and circles * substitution * rounding off of numbers |
| 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)   Revise the following formulae for calculating the perimeter/area of polygons and circles:  (Ask learners to name the formulae)   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | | | | | |  | NAME OF 2D | PERIMETER/AREA | FORMULAE |  | |  |  | | **RECTANGLE** | Perimeter |  | | Area |  | | **SQUARE** | Perimeter |  | | Area |  | | **TRAINGLE** | Perimeter | Sum of all the sides | | Area |  | | **CIRCLE** | Circumference |  | | Area |  |   NOTE: Learners should understand all the parameters in each formula. | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Activity 1: Worked examples:  Example 1: Calculate the perimeter and area of a square with a length  of  Solutions: Perimeter and  Area  Example 2: Calculate the perimeter and area of the triangle below:    Solutions: Perimeter and  Area  Example 3: Calculate the area of the shaded part of the shape below:  Solutions: Area of large circle        Area of small circle        Area of the shaded part | be actively involved during the lesson presentation.  name the formulae for polygons and circle. |

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| Activity 2: The area of a rectangle is and its length is   1. Calculate its breadth. 2. Calculate its perimeter.   Solutions:               1. Perimeter | Do activity 2 in groups and discuss their solutions with the whole class. |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   **Sasol-Inzalo workbook 2 page 59 no. 2 (c) and 69 no. 3 (a)**  **DBE workbook 2 page 47 no. 1 (a) and (b)** |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * learners should know and use the formulae for calculating the perimeter and area of polygons   and circles   * the use of formulae provides a context to practice solving equations by inspection or using   additive inverses.   * the height of a triangle is a line segment drawn from any vertex perpendicular to the opposite   side.   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.  **Homework:**  DBE workbook 2 page 47 no. 2 (a) and (b), |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREAS AND VOLUMES OF 3D OBJECTS:** AREA AND VOLUME OF 3D **(Lesson 1)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to use appropriate formulae to calculate the surface area, volume and capacity of cubes rectangular prisms and triangular prisms.** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Surface area, volume and capacity 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)   Revise with learners the following work done in Grade 7 by asking them to:   * define: * Surface area: The sum of the areas of all its faces. * Volume: The amount of 3D space an object takes up. * Capacity: The amount of space available inside an object. * convert between appropriate SI units. * then * then * name the 3D objects, draw the net, give the formulae of surface area and volume of the 3D objects on the table below.  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Name** | **Object** | **Net** | **Surface Area** | **Volume** | | Cube | s  s  s |  | SA =  OR  SA =  =  = | V = | | Rectangular Prism | *h*    *b* |  | SA= | V= | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| **Activity 1**: Worked examples:  Example 1:   1. Determine the surface area and the volume of the cube with   a length of   1. Convert answers in (a) to or   *Note! It may be a good idea to sketch the net of an object before doing the calculation.*  Solution:      4 cmCentre  4 cm  4 cm            Example 2   1. Determine the surface area and volume of the rectangular prism with the following dimensions length = 7 cm, breadth = 2 cm and height = 4 cm   7 cm  2 cm  4 cm   1. Convert answers in (a) to *or*   Solution: | actively engaged  during lesson  presentation by  answering questions |
| Activity 2  Example 1   1. Calculate the surface area and the volume of the triangular prism below: (The line from the vertex to the base is a perpendicular bisector).   http://everythingmaths.co.za/maths/grade-10/12-measurement/pspictures/615bfe0f93eff216de1859c123a71176.png  Solution: |  |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Work out the surface areas of the following. Give the answer in  https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcTACJnvHQmE7yjqyJzgDs_wX0swyoMPvWeOS7NwqUVVgqAfo8Ma  http://www.shmoop.com/images/prealgebra/unit4/pa.4.356.png |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * it may be a good idea to sketch the net for the object before doing calculations. * Learners must first write the formulae of the object before doing the calculations * Learners should substitute correctly * Learners must know the name of the 3D object, in order to determine the formula to be used.  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.  **Homework:**  Sasol-Inzalo workbook 2 page 78 no 2 and 4  DBE workbook 2 page 58 no 1(a) and (b) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREA AND VOLUME OF 3D OBJECTS:** SURFACE AREA AND VOLUME   **(Lesson 2)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to describe the interrelationship between surface area and volume of a cube, rectangular and triangular prisms.** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | * Surface area and volume of a cube, rectangular and triangular prisms done in the previous lesson. * factors |
| 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)   Revise with learners the following work done in lesson 1 by asking them to:  Determine the surface area and the volume of the following 3D shapes in the table.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Name** | **Object** | **Surface Area** | **Volume** | **Ratio** | | Cube | 3  3  3 |  |  |  | | Rectangular Prism | *h= 3*  *= 4*  *b=2* |  |  |  | | Triangular Prism | 4  6  3 |  |  |  | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| **Activity 1**: Worked examples:  Example 1: The table below represents cubes with different dimensions:     1. Complete the table.  |  |  |  | | --- | --- | --- | | Size of Cube | Surface Area | Volume | | 1 by 1 by 1 |  |  | | 2 by 2 by 2 |  |  | | 3 by 3 by 3 | 54 | 27 | | 4 by 4 by 4 | 96 | 64 | | 5 by 5 by 5 | 150 | 125 | | 8 by 8 by 8 | 384 | 512 |  1. Does the surface area increase or decrease as the length of the side of the cube increases? 2. Does the volume increase or decrease as the length of side of the cube increases? 3. Does volume or surface area increase more rapidly when the length of the side of the cube increases?   Solutions:   1. See the numbers written in red on the table. 2. Yes, the surface area of the cube increases as the length of the   side increases.   1. Yes, the volume increase as the length of the side of the cube   increases.   1. The volume increases more rapidly when the length of the side of the cube increases.   Note: Learners should complete the table without the numbers written in red. | actively engaged  during lesson  presentation by  answering questions and completing the table |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Do objects with the same volume always have the same surface area? Do this investigation below in order to find out.   1. Calculate the surface area of the following rectangular prisms by completing the table below.     NOTE. The dimension must be all the factors of 24 – *1 ; 2 ; 3 ;4 ; 6 ; 8 ; 12; 24*   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **length** | **width** | **height** | **Volume (** | **Surface area** | | 1 |  |  | 24 |  | |  |  | 6 | 24 |  | |  | 3 |  | 24 |  | |  |  | 1 | 24 |  | | 8 |  |  | 24 |  | |  | 2 |  | 24 |  |  1. What can you conclude about the surface area and the volume of the objects? |
| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * it may be a good idea to sketch the net for the object before doing calculations. * Learners must know the formulae of the object by writing the formula before doing calculations * Learners should substitute correctly * Learners should know the name of the object in order to determine the formula to be used.  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.  **Homework:**  Sasol-Inzalo workbook 2 page 81 no 1 and 2 |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREA AND VOLUME OF 3D OBJECTS:** SURFACE AREA AND VOLUME   **(Lesson 2)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to describe the interrelationship between surface area and volume of a cube, rectangular and triangular prisms.** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | * Surface area and volume of a cube, rectangular and triangular prisms done in the previous lesson. * factors |
| 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)   Revise with learners the following work done in lesson 1 by asking them to:  Determine the surface area and the volume of the following 3D shapes in the table.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Name** | **Object** | **Surface Area** | **Volume** | **Ratio** | | Cube | 3  3  3 |  |  |  | | Rectangular Prism | *h= 3*  *= 4*  *b=2* |  |  |  | | Triangular Prism | 4  6  3 |  |  |  | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| **Activity 1**: Worked examples:  Example 1: The table below represents cubes with different dimensions:     1. Complete the table.  |  |  |  | | --- | --- | --- | | Size of Cube | Surface Area | Volume | | 1 by 1 by 1 |  |  | | 2 by 2 by 2 |  |  | | 3 by 3 by 3 | 54 | 27 | | 4 by 4 by 4 | 96 | 64 | | 5 by 5 by 5 | 150 | 125 | | 8 by 8 by 8 | 384 | 512 |  1. Does the surface area increase or decrease as the length of the side of the cube increases? 2. Does the volume increase or decrease as the length of side of the cube increases? 3. Does volume or surface area increase more rapidly when the length of the side of the cube increases?   Solutions:   1. See the numbers written in red on the table. 2. Yes, the surface area of the cube increases as the length of the   side increases.   1. Yes, the volume increase as the length of the side of the cube   increases.   1. The volume increases more rapidly when the length of the side of the cube increases.   Note: Learners should complete the table without the numbers written in red. | actively engaged  during lesson  presentation by  answering questions and completing the table |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   Do objects with the same volume always have the same surface area? Do this investigation below in order to find out.   1. Calculate the surface area of the following rectangular prisms by completing the table below.     NOTE. The dimension must be all the factors of 24 – *1 ; 2 ; 3 ;4 ; 6 ; 8 ; 12; 24*   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **length** | **width** | **height** | **Volume (** | **Surface area** | | 1 |  |  | 24 |  | |  |  | 6 | 24 |  | |  | 3 |  | 24 |  | |  |  | 1 | 24 |  | | 8 |  |  | 24 |  | |  | 2 |  | 24 |  |  1. What can you conclude about the surface area and the volume of the objects? |
| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * it may be a good idea to sketch the net for the object before doing calculations. * Learners must know the formulae of the object by writing the formula before doing calculations * Learners should substitute correctly * Learners should know the name of the object in order to determine the formula to be used.  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.  **Homework:**  Sasol-Inzalo workbook 2 page 81 no 1 and 2 |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREA AND VOLUME OF 3D OBJECTS:** CALCULATIONS AND SOLVING   PROBLEMS  **(Lesson 3)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to solve problem, with or without a calculator, involving surface area** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Surface area of a cube, rectangular and triangular prisms done in the previous lessons. |
| 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)   Revise with learners the following work done in lesson 1 by asking them to:   * define: * Surface area: The sum of the areas of all its faces. * Volume: The amount of 3D space an object takes up. * Capacity: The amount of space available inside an object. * match the name with Column A and column B  |  |  |  | | --- | --- | --- | | **Name** | **Colunm A** | **Column B** | | Cube |  |  | | Rectangular Prism |  |  | | Triangular Prism |  |  | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present the following activity and let learners work in pairs  Activity  Example 1:   1. A box is 30 long, 20 wide and 15 high.   Calculate:   1. the surface area of the box 2. the surface area of the box if its sides are doubled in length.   Solution:               1. The surface area of a cube is 1 497,84 . Calculate the length of one side of the cube.   Solution:            Example 2:   1. The length of a triangular prism is the triangles’ height is and the triangle’ base is Calculate the surface area.   Solution: | actively engaged  during lesson  presentation by  answering questions in pairs |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) 2. Calculate the length of a rectangular prism with breadth 11,2 , height 9,7 and the surface area .     9,7 cm  11,2 cm     1. The diagram below shows Anna’s rectangular block of candle wax with length 15 , breadth   10 and height 8 . Anna melts the candle wax and uses all the wax to make a cube-shape  candle.  8  10  15    Calculate:   * 1. the surface area of the block of wax   2. the volume of the block of wax   3. the length of the sides of the cube   4. the surface area of the cube   5. compare the surface area of the cube to the surface area of the rectangular block |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * it may be a good idea to sketch the net for the object before doing calculations. * know the formulae of the object by writing the formula before doing calculations  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.  **Homework:**  Sasol-Inzalo workbook 2 page 76 no. 2 and 3  DBE workbook 2 page 57 Problem Solving at the bottom. |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREA AND VOLUME OF 3D OBJECTS:** CALCULATIONS AND SOLVING   PROBLEMS  **(Lesson 4)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to solve problem, with or without a calculator, involving volume and capacity.** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Volume and capacity of a cube, rectangular and triangular prisms done in the previous lessons. |
| 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)   Revise with learners the following work done in lesson 1 by asking them to:   * define: * Surface area: The sum of the areas of all its faces. * Volume: The amount of 3D space an object takes up. * Capacity: The amount of space available inside an object. * Show the difference between capacity and volume in the table below.  |  |  |  |  | | --- | --- | --- | --- | | **Name** | **Object** | **Volume** | **Capacity** | | Cube | 2 cm |  |  | | Rectangular Prism | 7 cm  6 cm  3 cm |  |  | | Triangular Prism | 2 cm  5 cm  4 cm |  |  | | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to:) |
| Present the following activity and let learners work in pairs  **Activity 1**:    Example 1:   1. A solid block of wood measures Calculate the volume of the block.     Solution         1. The same solid block of wood is carved out to make a hollow container. The measurements inside the container are      1. How thick are the walls of the container? 2. What is the capacity of the container? 3. If you filled the container with water, what volume of water would the container hold?   Solution   1. Sides 5 cm and bottom 2 cm | actively engaged  during lesson  presentation by  answering questions in pairs |

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| 1. **CLASSWORK** (Suggested time: 15 minutes) 2. Calculate the capacities of the following containers. The measurement are given. |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * Volume is the amount of space that an object occupies, and the capacity is the amount of space   available inside an object.   * words like must be use when the capacity is calculated * learners should know the units of measurement.  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.  **Homework:**  DBE workbook 2 page 57 no. 1 (a) to (d) |

**MATHEMATICS LESSON PLAN**

**GRADE 8**

**TERM 3: JULY – SEPTEMBER 2015**

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

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| 1. **TOPIC: SURFACE AREA AND VOLUME OF 3D OBJECTS:** CALCULATIONS AND SOLVING   PROBLEMS **(Lesson 5)** |

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| 1. **CONCEPTS & SKILLS TO BE ACHIEVED:**   **By the end of the lesson learners should know and be able to use and convert between appropriate SI units, including:** |

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| 1. **RESOURCES:** | Sasol-Inzalo workbook 2, DBE workbook 2, textbook. |
| 1. **PRIOR KNOWLEDGE:** | Volume and capacity of a cube and rectangular prisms done in the previous lessons. |
| 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)   Revise with learners the following:  A       1. Write the following in b) Write the following in 2. i) 3. ii)   Solution Solution   1. i) 2. ii)   B     1. Write the following volume in   Solution | |

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| 1. **LESSON PRESENTATION/DEVELOPMENT** (Suggested time: 20 minutes) | |
| **Teaching activities** | **Learning activities**  (Learners are expected to: ) |
| Present the following activity and let learners work in pairs  **Activity 1**:    Example 1:   1. Calculate the volume of the box and write your answer in   Solution        (   1. A solid block of wood is carved out to make a hollow container. The measurements inside the container are      1. What is the capacity of the container? 2. Write the answer in   Solution     1. ( | actively engaged  during lesson  presentation by  answering questions in pairs |

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| 1. **CLASSWORK** (Suggested time: 15 minutes)   **Sasol-Inzalo workbook 2 page 83 no. 1, 2 and 3, page 80 no. 1** |

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| 1. **CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)** |
| 1. **Emphasise that**:  * Learners should always convert between units as shown on the table below:  |  |  |  |  | | --- | --- | --- | --- | | To convert | Do this | To convert | Do this | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  |  * and  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.  **Homework:**  Sasol-Inzalo 2 page 84 no. 2 and page 85 no. 4 |