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|  | TEACHER’S ACTIVITY | | | STUDENT’S ACTIVITY |
| THEME | Number and Numeration | | |  |
| CLASS | SS1 | | |  |
| DATE | Monday, 17th September, 2024 | | |  |
| SUBJECT | Mathematics | | |  |
| MODE | Entire Class | | |  |
| TIME | 8.40am – 9.20am | | |  |
| PERIOD | 1st | | |  |
| DURATION | 40 Minutes | | |  |
| UNIT LESSON | Basic operations involving number base system  Addition and subtraction | | |  |
| LESSON TOPIC | Number Bases II | | |  |
| SPECIFIC OBJECTIVES | At the end of this lesson, learners should be able to:   1. Use the and basic operative symbol; 2. Solve problems in different number system using the and basic operative symbol; 3. Acquire the calculative skill necessary in solving math problems in everyday life. | | |  |
| INSTRUCTIONAL RESOURCES | Charts showing the conversion from one base (except base 2) to another base, counting cubes | | |  |
| PRESENTATION | The teacher presents the lesson through the following steps. | | |  |
| STEP 1 | **IDENTIFICATION OF PRIOR IDEA** | | |  |
|  | The teacher activates prior knowledge by asking the students to state the process of addition and subtraction of numbers. | | | The students answer the question. |
| STEP 2 | **EXPLORATION** | | |  |
|  | The teacher explores further by tasking the students to solve a simple addition and subtraction problem. | | | The students perform the task. |
| STEP 3 | **DISCUSSION** | | |  |
|  | **Basic operations with bases**  Addition and Subtraction  The main operations we carry out with numbers are the four basic operations of **addition**, **subtraction**, **division**, and **multiplication** (, , , ).  Addition and subtraction in any base other than ten are the same, the only exception is that the number/digit would not exceed the highest digit in the base. | | |  |
| STEP 4 | **APPLICATION** | | |  |
|  | Example 1  Simplify the following:   1. 728 6438 2. 23114 2134 3. Find *N* if 1222*four* 2003*four* *Neight*   Solution   1. 72   643  735  Here, we start from the right column to add 2 3 5, five is a digit and does not exceed 8, so the digit 5 is left like that. Then we add the second column 7 4 11 containing a big bundle of 8 and 3 small bundles of 8, so we write 13 instead of 11, hence we write 3 in the second column and the 1 left to the next column on the left. Thus, 6 1 7. The answer is then 7358­.   1. 23114 2134   2311  213  20324     1. *Neight* 1222*four* 2003*four*     1222  2003  3231*four*  Now, converting 3231*four* to decimal, we have  33223110*four* (3 43) (2 42) (3 41) (1 40)  192 32 12 1  237*ten*  Converting 237ten to octal   |  |  | | --- | --- | | 8 | 237 | | 8 | 29 R 5 | | 8 | 3 R 5 | |  | 0 R – 3 |   *Neight* 3558 | | | The students listen to the teacher and ask questions. |
| STEP 5 | **EVALUATION** | | |  |
|  | The teacher evaluates the lesson with the questions below.   1. Add 3018, 4078, and 1708. 2. If 3014five 2112five *x*five, what is the value of *x*? | | | The students solve the problems. |
| SUMMARY AND CONCLUSION | The teacher concludes the lesson by summarising the unit lesson. | | |  |
| ASSIGNMENT | Exercise 1.4, pg. 28, questions 1 & 7. | | |  |
| REFERENCE | New School Mathematics for senior secondary school by M. N. David-Osuagwu, Chinwa Anemelu, Ijeoma Onyeozili. | | |  |
|  | TEACHER’S ACTIVITY | | | STUDENT’S ACTIVITY |
| THEME | Number and Numeration | | |  |
| CLASS | SS1 | | |  |
| DATE | Tuesday 17th September, 2023 | | |  |
| SUBJECT | Mathematics | | |  |
| MODE | Entire Class | | |  |
| TIME | 8.00am – 8.40am | | |  |
| PERIOD | 1st | | |  |
| DURATION | 40 Minutes | | |  |
| UNIT LESSON | Basic operations involving number base system  Multiplication and Division | | |  |
| LESSON TOPIC | Number Bases II | | |  |
| SPECIFIC OBJECTIVES | At the end of this lesson, learners should be able to:   1. Use the and basic operative symbol; 2. Solve problems in different number system using the and basic operative symbol; 3. Acquire the calculative skill necessary in solving math problems in everyday life. | | |  |
| INSTRUCTIONAL RESOURCES | Charts showing the conversion from one base (except base 2) to another base, counting cubes | | |  |
| PRESENTATION | The teacher presents the lesson through the following steps. | | |  |
| STEP 1 | **IDENTIFICATION OF PRIOR IDEA** | | |  |
|  | The teacher activates prior knowledge by asking the students to define average. | | | The students answer the question. |
| STEP 2 | **EXPLORATION** | | |  |
|  | The teacher explores by tasking the students to find the average of a sum of numbers. | | | The students solve the problem. |
| STEP 3 | **DISCUSSION** | | |  |
|  | **Multiplication and Division**  In the case of multiplication, it follows the same pattern as that of multiplication in base ten, the only difference here is that instead of thinking in tens we go along in the given base.  Division in bases other than base 10 is the same, the only difference is when the first digit of the dividend is less than the divisor, we convert the digit (dividend) to the next place value. | | |  |
| STEP 4 | **APPLICATION** | | |  |
|  | Example 1  Simplify the following:   1. 3324*five* 31*five* 2. 11011*two* 101*two*   Solution   1. 3324*five* 31*five*   3 3 2 4  3 1  3 3 2 4  2 1 0 3 2  2 1 4 1 4 4*five*   1. 11011*two* 101*two*   1 1 0 1 1  1 0 1  1 1 0 1 1  0 0 0 0 0  1 1 0 1 1  1 0 0 0 0 1 1 1*two*  Example 2  The total of four numbers is 12145. What is their average, expressed in base 5?  Solution  Since there are four numbers whose total is 12145, then their average 45.  Now, we convert both the dividend (12145) and the divisor (45) to base 10, carried out the division process, then convert the result back to base 5.  132211405 (1 53) (2 52) (1 51) (4 50)  125 50 5 4  18410  Now, 18410 410 4610  Converting 4610 to base 5   |  |  | | --- | --- | | 5 | 46 | | 5 | 9 R 1 | | 5 | 1 R 4 | |  | 0 R – 1 |   45 1415 | | | The students listen to the teacher and ask questions. |
| STEP 5 | **EVALUATION** | | |  |
|  | The teacher evaluates the lesson with the questions below:   1. Find the product of 2145 and 1025. 2. 22113 113 | | | The students solve the problem. |
| SUMMARY AND CONCLUSION | The teacher concludes the lesson by summarising the unit lesson. | | |  |
| ASSIGNMENT | Exercise 1.4, pg. 28, question 14 *(c)*. | | |  |
| REFERENCE | New Concept Mathematics for senior secondary school book 1 by H. N. Odogwu, A. A. Arigbabu, et al.  New School Mathematics for senior secondary school by M. N. David-Osuagwu, Chinwa Anemelu, Ijeoma Onyeozili. | | |  |
|  | | TEACHER’S ACTIVITY | STUDENT’S ACTIVITY | |
| THEME | | Number and Numeration |  | |
| CLASS | | SS1 |  | |
| DATE | | Thursday 19th September, 2023 |  | |
| SUBJECT | | Mathematics |  | |
| MODE | | Entire Class |  | |
| TIME | | 8.00am – 8.40am |  | |
| PERIOD | | 1st |  | |
| DURATION | | 40 Minutes |  | |
| UNIT LESSON | | Equations involving number base system  Application of number base system to computer |  | |
| LESSON TOPIC | | Number Bases II |  | |
| SPECIFIC OBJECTIVES | | At the end of this lesson, learners should be able to:   1. Identify simple equations in number base system; 2. Solve simple equations involving number base system; 3. State the application of number base system to computers. |  | |
| INSTRUCTIONAL RESOURCES | | Charts showing the conversion from one base (except base 2) to another base, counting cubes |  | |
| PRESENTATION | | The teacher presents the topic with the aid of these steps: |  | |
| STEP 1 | | **IDENTIFICATION OF PRIOR IDEA** |  | |
|  | | The teacher asks the students to define a number base system. | The students answer the question. | |
| STEP 2 | | **EXPLORATION** |  | |
|  | | The teacher explores by tasking the students to solve the equation 7*x* 20 3*x*. | The students solve the equation. | |
| STEP 3 | | **DISCUSSION** |  | |
|  | | **Equations involving number base system**  In everyday life, we count or estimate quantities using groups of ten items or units. This may be so because, we have ten fingers. For example, when we count ten, i.e., we write 10 meaning one group of 10 and no units. A quantity like twenty-five, written as 25 means 2 groups of 10 and 5 units.  **Application of number base system to computers**  A computer can understand the positional number system where there are only a few symbols called digits and these symbols represent different values depending on the position they occupy in the number.  In [computer](https://stoplearn.com/category/computer-studies-jssce/) programming, the punched cards use binary numbers instead of letters. It is used in the on-off system, the go-no go system, or the open-closed system. |  | |
| STEP 4 | | **APPLICATION** |  | |
|  | | Example 1  Given that 123*x* 2710.  Solution  122130*x* 2710  (1 *x*2) (2 *x*1) (3 *x*0) 27  *x*2 2*x* 3 27  *x*2 2*x* 24 0  *x*2 6*x* 4*x* 24 0  *x*(*x* 6) 4*x*(*x* 6) 0  (*x* 6) (*x* 4) 0  *x* 6 or 4  The base is 4 because the base of a number is always positive.    Example 2  Given that 13*x* 22*y* 1610 and 32*x* 12*y* 2210, find the values of *x* and *y*.  Solution  13*x* 22*y* 1610  (1 *x*1) (3 *x*0) (2 *y*1) (2 *y*0) 16  *x* 3 2*y* 2 16  *x* 2*y* 11 - - - - (1)  32*x* 12*y* 2210  (3 *x*1) (1 *x*0) (1 *y*1) (2 *y*0) 22  3*x* 1 *y* 2 22  3*x* *y* 18 - - - - (2)  Solving (1) and (2) simultaneously, we have  (1) 1; (2) 2  *x* 2*y* 11    6*x* 2*y* 36  5*x* 25  *x* 5  Substituting *x* 5 in equation (1)  5 2*y* 11  2*y* 6  *y* 3  *x* 5 and *y* 3 | The students listen to the teacher and ask questions. | |
| STEP 5 | | **EVALUATION** |  | |
|  | | The teacher evaluates the lesson with the question below:   1. State the applications of number base system to computer programming. 2. If (23)*n* (1111)2 , find the base *n*. | The students solve the problem. | |
| SUMMARY AND CONCLUSION | | The teacher concludes the lesson by summarising the unit lesson. |  | |
| ASSIGNMENT | | 1. x and y are non-zero digits such that xxxthree= yyeight. Find x and y.  Given that 4P45 = 11910, find the value of P.  A. 1 B. 2 C. 3 D. 4 SSCE 2003  2. Evaluate (111two)2 – (101two)2  A. 10two B. 100two C. 1100two D. 11000two SSCE 2003  3. If M5ten = 1001011two, find the value of M.  A. 5 B. 6 C. 7 D. 8 SSCE 2002  4. Evaluate (20three)2 – (11three)2 in base three.  A. 101 B. 121 C. 202 D. 2020 SSCE 2001  5. Find if 200x+ 144nine = 14Btwelve  6. Solve for x and y if 32x + 53y =61nine  24x + 35y = 45ten |  | |
| REFERENCE | | New Concept Mathematics for senior secondary school book 1 by H. N. Odogwu, A. A. Arigbabu, et al.  New School Mathematics for senior secondary school by M. N. David-Osuagwu, Chinwa Anemelu, Ijeoma Onyeozili. |  | |