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| **THEME:** | Binary numbers |
| **DATE**: | 18 – 09 – 2024 |
| **CLASS**: | Js 3 |
| **TIME**: | 8:40-09:20am |
| **DURATION** | 40 minutes |
| **SUBJECT**: | Mathematics |
| **UNIT TOPIC:** | Binary Numbers |
| **LESSON TOPIC:** | Binary Multiplication |

**SPECIFIC OBJECTIVE**: By the end of the lesson, students should be able to

1. Define binary multiplication
2. State the binary multiplication rules and table.
3. Solve binary multiplication questions

**INSTRUCTIONAL RESOURCES:**  Flash Cards and charts

**LESSON PRESENTATION**

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| **STEP 1** | **PREVIOUS KNOWLEDGE:** last class we learnt the meaning of binary and the addition and subtraction of binary. | | Students recall. |
| **STEP 2** | **EXPLORATION:**  The teacher introduces the topic with the following questions:   1. What is binary multiplication? 2. Do you know the binary multiplication rules/table? 3. Can you solve a binary multiplication question?? | | Students make attempt to answer the questions. |
| **STEP 3**  ***Objective1:***  ***Objective 2:***  ***Objective 3:*** | **DISCUSSION: *The teacher starts the discussion by explaining binary multiplication:***  The binary multiplication operation is actually a process of addition and shifting operation. This process has to be continued until all the multiplier is done, and finally, the addition operation is made.  Similar to the decimal system, the multiplication of the binary numbers is done by multiplying the multiplicand with the multiplier.  **Binary Multiplication Table:** The multiplication table for binary numbers is given below:   1. 0 x 0 = 0 2. 1 x 0 = 0 3. 0 x 1 = 0 4. 1 x 1 = 1   It is noted that the multiplication by zero makes all the bits zero, the multiplication by 1 makes all the multiplicand value unchanged.  **Solving multiplication equations on Binary**  Example 1: Solve 10102 x 1012  10102  x1012  1010  0000  1010  1100102 | | Students listen attentively and take down notes. |
| **STEP 4** | **APPLICATION:** multiply these numbers in binary form 11012 and 1112  **Solution**  11012  x1112  1101  1101  1101  10110112 | | Students ask questions on the topic which the teacher answers. |
| **STEP 5** | **EVALUATION:** the teacher evaluates the students with the following questions:   1. What is binary multiplication? 2. State binary multiplication rules/table? 3. Solve 101012 x 1102 | | The students answer the questions. |
| **Assignment**  Multiply 10001 x 111  Find the value of 11111 x 10000  **References**  **New concept mathematics for Jss3 by A. A. Arigbabu et al.**  **New general mathematics for Jss3 by M/ F. Macrae et al.** | |  |