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| **UNIT OF STUDY :   Data Representation in Computing** |

**STAGE 1: Desired Results**

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| **Standards/Goals:** *What relevant goals (e.g. content standards, course program objectives, learning outcomes) will this design address?*  1.Students will develop an understanding of  the attributes of design (8) .  2.Students will develop abilities to use and maintain technological Products (12) .  3.Students will develop an understanding of and be able to select and use information and communication technologies . (17) |
| **Enduring Understandings:** *What are the big ideas? understanding? transfer of learning? What specific understandings about them are desired? What misunderstandings are predictable?*  **Students will understand that....**   * there are different kinds of numbering systems ( binary, decimal, octal...etc) * each number system can be transformed from one format to another * there are standards to represent all characters in binary system. * they can do basic calculations in binary numbering systems * there are different kinds of data formats ( sounds , Texts, video...etc) all transformed into binary |
| **Essential Questions:** *What provocative questions will foster inquiry? What are the big ideas? understanding? transfer of learning?*   * How do computer understands human language * How computers do calculation. * Explain how computers understand  voices. * How computer manipulates data. * How are the human brain and computer similar . |
| |  |  | | --- | --- | | **Knowledge:** *What key knowledge and skills will students acquire as a result of this unit?*  **Students will know...**   * bits and bytes in computer main memory * Various kinds of numbering systems * Characters ( on keyboard) representation in binary system * Basic logic and arithmetic operations using binary systems * Transformations through different numbering systems . | **Skills:** *What should they eventually be able to do as a result of such knowledge and skill?*  **Students will be able to...**   * Use transformation relations of one system to another . * To be familiar with the key board buttons * Make calculating problems using binary system * Determine the appropriate data format of input. |     **Stage 2: Assessment Evidence** |
| **Performance Tasks:**   * research to explain what memory size needed to represent given numbers in bits * research and report to determine what hardware needed to make calculations * report on the data size allocated in computer for given page of book * assignment to determine which data type must used in given input |
| **Other Evidence:**   * Inspiration brainstorm * Documentation of Internet research (annotated citations) * Outline of draft * Rough draft of the report * Notes for debate which easier for human to use binary or decimal for calculations * Quick response to the teacher while explaining the subject . * The students discussion and interaction with the teacher  in the class . * quiz and exam |
| **Stage 3: Learning Plan** |
| **Possible Learning Activities:** *Think about the W.H.E.R.E.T.O.* *diagram*   * Investigate different types of computing systems . * why human are using decimal system and why computer uses binary. * Do the following transformation  from binary to characters * Make conversions from number system to another * Do arithmetic's on binary system * Design a concept map for data representation using inspiration. |
| **Scope and Sequence:**  *Timeline*   * **1 week** |