# C2- S2 BINARY NUMBERS

**Q1 -** Fill in the binary equivalents for the decimal numbers below.  We’ve started the first three for you.

|  |  |  |  |
| --- | --- | --- | --- |
| **BINARY** | **DECIMAL** | **BINARY** | **DECIMAL** |
| 0000 | 0 | 1000 | 8 |
| 0001 | 1 | 1001 | 9 |
| 0010 | 2 | 1010 | 10 |
| 0011 | 3 | 1011 | 11 |
| 0100 | 4 | 1100 | 12 |
| 0101 | 5 | 1101 | 13 |
| 0110 | 6 | 1110 | 14 |
| 0111 | 7 | 1111 | 15 |

**Q2 -** What do you notice when you compare the odd numbers with the even numbers?  What might explain this?

**Q3** Find the equivalent binary or decimal numbers below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Binary** | **Decimal** |  | **Binary** | **Decimal** |
| **100** | 4 |  | 00101 | **5** |
| **101** | 5 |  | 10001 | **17** |
| **1101** | 13 |  | 111111 | **63** |
| **0001 1111** | 31 |  | 1000000 | **64** |
| **0010 0000** | 32 |  | 1111111 | **127** |
| **1010 1010** | 170 |  | 100000000 | **256** |
| **1111 1111** | 257 |  | 1000000001 | **513** |

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**Q4** Do the binary numbers “0011” and “000011” have the same value or different values?  Explain.

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**Q5** How many bits would you need if you wanted to count from 0 to number 100 (decimal) ?

**Q6 Binary game**

<https://learningcontent.cisco.com/games/binary/index.html>

Perform the game and **print your BEST SCORE** on this document

