## **Counting In Binary**

**Activity 1:** Using the table below, count in binary. Check your answers occasionally to make sure you're still on the right track. Keep counting until you are confident you have it down.

**Activity 2:** Look at the sequence of numbers and identify patterns in the 1's and 0's. Try to create statements that help describe the patterns that exist.

| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | DEC                   |
|-----|----|----|----|---|---|---|---|-----------------------|
|     |    |    |    |   |   |   |   | 0                     |
|     |    |    |    |   |   |   |   | 1                     |
|     |    |    |    |   |   |   |   | 2                     |
|     |    |    |    |   |   |   |   | 3                     |
|     |    |    |    |   |   |   |   | 2<br>3<br>4<br>5<br>6 |
|     |    |    |    |   |   |   |   | 5                     |
|     |    |    |    |   |   |   |   | 6                     |
|     |    |    |    |   |   |   |   | 7                     |
|     |    |    |    |   |   |   |   | 8                     |
|     |    |    |    |   |   |   |   | 9                     |
|     |    |    |    |   |   |   |   | 10                    |
|     |    |    |    |   |   |   |   | 11                    |
|     |    |    |    |   |   |   |   | 12                    |
|     |    |    |    |   |   |   |   | 13                    |
|     |    |    |    |   |   |   |   | 14                    |
|     |    |    |    |   |   |   |   | 15                    |
|     |    |    |    |   |   |   |   | 16                    |
|     |    |    |    |   |   |   |   | 17                    |
|     |    |    |    |   |   |   |   | 18                    |
|     |    |    |    |   |   |   |   | 19                    |
|     |    |    |    |   |   |   |   | 20                    |
|     |    |    |    |   |   |   |   | 21                    |
|     |    |    |    |   |   |   |   | 22                    |
|     |    |    |    |   |   |   |   | 23                    |
|     |    |    |    |   |   |   |   | 24                    |
|     |    |    |    |   |   |   |   | 25                    |
|     |    |    |    |   |   |   |   | 26                    |
|     |    |    |    |   |   |   |   | 27                    |
|     |    |    |    |   |   |   |   | 28                    |
|     |    |    |    |   |   |   |   | 29                    |
|     |    |    |    |   |   |   |   | 30                    |
|     |    |    |    |   |   |   |   | 31                    |
| -   |    |    |    |   |   |   |   | 32                    |

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| 128 | 64 | 32 | 16                                      | 8                                                                                         | 4                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                                                                                                | DEC                                                                                                                                                                                                                                                                                 |
|-----|----|----|-----------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |    |    | 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 | 1 1 1 1 1 1 0 0 0 0 0 0 0 1 1 1 1 1 1 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1 1 1 1 0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1 | 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | O<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1 | $\begin{array}{c} 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \end{array}$ |

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