

Activity Guide - Representing Numbers



Binary Number Cards

Work with your group to figure out which cards should be face up or face down to get the correct number of dots. Put a “U” under a card that should be face up and a “D” under a card that should be face down. The first one has been done for you.

How many dots?				
13	U	U	D	U
5	D	U	D	U
10	U	D	U	D
2	D	D	U	D

What's the lowest number you can make?

What's the highest number you can make?

Using the Pattern

You can use the same pattern even without the cards. Shade over the cards you do NOT want to use to make your number. The first one has been done for you.

7				
12				

3				
6				

5-bit Numbers

1.	
----	--

In this 5-bit system for binary numbers, what number should go in the left-most box? 16

2. How would you make...

16?	
-----	--

27?	
-----	--

31?	
-----	--

6-bit Numbers

1. In a 6-bit number system, what numbers should go in each of the boxes?	
---	--

2. The record for most skips by a dog and person in one minute is 59. How would you encode 59 in binary?

--



Create a Binary Profile

Answer each of the questions on the left, but encode your answers as a binary number on the right. Use the online widget to help create a personal profile in binary.

Encoded Profile Data

1) How old are you?	<table><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr></table>	0	1	0	1	0	1
0	1	0	1	0	1		
2) What is your birth date? Not the month - just the date	<table><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr></table>	0	0	1	0	0	1
0	0	1	0	0	1		
3) How many siblings do you have?	<table><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr></table>	0	0	1	0	0	0
0	0	1	0	0	0		
4) Estimate how many minutes it takes to get to school each morning	<table><tr><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td></tr></table>	1	1	0	0	1	0
1	1	0	0	1	0		
5) Timestamp: Look at a clock and record only the minutes for what time it is right now.	<table><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr></table>	1	1	1	0	0	0
1	1	1	0	0	0		

Use the online widget and the information above to decode a partner's personal profile in binary

Decoded Profile Data

1) How old are you?	21
2) What is your birth date? Not the month - just the date	9
3) How many siblings do you have?	5
4) Estimate how many minutes it takes to get to school each morning	90
5) Timestamp: Look at a clock and record only the minutes for what time it is right now.	56

Challenge: Asking Your Own Question

Use the 8-bit binary system to send a question to a classmate and have them answer in binary.

Question: 01000001 01110010 01100101 00100000 01111001 01101111
01110101 00100000 01100110 01101001 01101110 01100101

Answer: 01011001 01100101 01110011