

These pages are from the G4 "Patterns Can Transfer Information" Journal.



It takes many bits to store data

Since we can store information such as words, pictures and music on a computer, you might think that computers can remember more than just numbers. It certainly looks like that to us, but from the computer's perspective, everything your computer remembers is just a binary pattern. Digital technology really only uses the numbers 0 and 1! Digital information is made of many small bits put together.

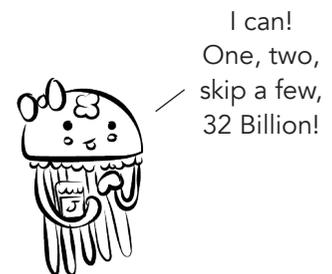
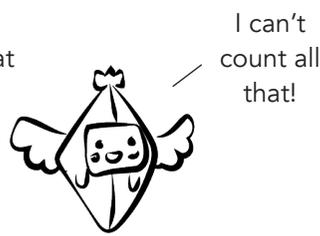
How many bits do you need to make ...?

Number of bits

How long it would take to count to that number

How many bits do you need to make ...?	Number of bits	How long it would take to count to that number
A single letter	8	8 seconds
A sentence	560	9 minutes and 20 seconds
A paragraph	8,000	2 Hours and 13 Minutes
A photo	240,000	2 Days and 18 Hours
One minute of MP3 music	8,000,000	13 Weeks and 1 Day
One minute of video	40,000,000	1 Year and 3 Months
One CD of music	5,600,000,000	177 Years and 6 Months
One DVD video	32,000,000,000	1014 Years and 8 Months

Count to 32 billion!



Decode the bits to make a photo

Let's pretend that a computer program tells the computer that these bits are storing information about a picture that is 12 squares wide and 11 squares tall. The program then specifies these color codes for the file;

- "11" means the color white
- "01" means the color gray
- "00" means the color black.

With these instructions, the computer uses the information stored in the bits and creates a picture.

Decode the image of Great Grandpa!

11	11	11	11	11	11	11	11	11	11	11	11
11	11	11	11	01	01	01	01	11	11	11	11
11	11	11	01	01	01	01	01	01	11	11	11
11	11	01	01	01	01	01	01	01	01	11	11
11	01	01	00	00	00	00	00	00	01	01	11
11	01	01	01	00	01	01	00	01	01	01	11
11	01	01	01	01	01	01	01	01	01	01	11
11	01	01	00	01	01	01	01	00	01	01	11
11	11	01	00	00	00	00	00	00	01	11	11
11	11	11	01	01	01	01	01	01	11	11	11
11	11	11	11	01	01	01	01	11	11	11	11



Use the color code above to render the picture.

It's a picture of my great grandpa!

You can see where I got my cuteness from.

