



# How We Convert to Binary

Can you convert your age to binary, the number system of computers?

$$9_{10} = ?_2$$

The little numbers represent the base of the number. 10 is our decimal system. 2 is the binary system which computers use.

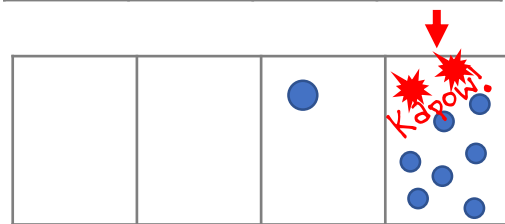
We can use the Imploding Things Machine to compute our age in binary. This is helpful when we work with computers.

It works like this... Lets pretend we are 9 years old.

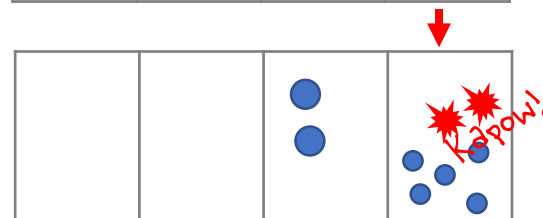
Enter the number of dots that represent the age 9 in the rightmost box.



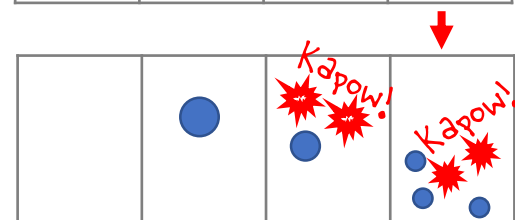
Whenever there are 2 dots in a box they implode and become a bigger dot, one box to the left.



This process repeats until there are no boxes with more than 1 dot.



...and again...

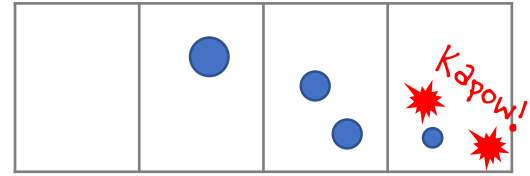


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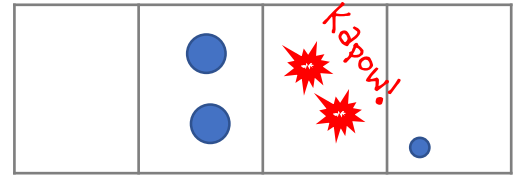
EXPERIENCE I

# The Imploding Things Machine

...and again...



...and again...



...and again...



The machine is finished when each box has no dots or 1 dot.



We would write a 1 for each box with a dot and a 0 for each box with no dot.

1 0 0 1

If your age is 9, then you are 1001 years old in binary!

$$9_{10} = 1001_2$$

Try this experience again, but this time enter your age!