

unit 1

More About the Naming Game

A Short Interlude: Adding in Binary (review)



- *Fact:* A **Central-Processing Unit (CPU)** is the “brain” of the computer—it is a chip that is filled with microscopic circuits that can be either “on” or “off”; the main purpose of a CPU is to manipulate bits, converting data into information.





Fact: The CPU can manipulate bits in only three ways:

- It can remember and recall bits
- It can add bits.
- It can compare bits

What are the
rules of binary
addition?

Now back to "The
Naming Game"...

- *Fact:* Since the computer doesn't understand our regular numbers, we must “name” these for the computer in binary, i.e., we even have to play the Naming Game for regular numbers!

Item	Computer Name (using one bit)
	0
	1

Item	Computer Name (using five bits)
5	0 0 1 0 1
2	0 0 0 1 0

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- *Def: A **decimal number** is the technical name given to our regular numbers.*

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- *Def: A **binary number** is the technical name given to numbers built from a collection of bits.*

Binary Number Examples				
0	0	1	0	1
		1	1	

Made from only 1 or 0

Decimal Number Examples			
1	0	3	2
9	0	8	4

Made from any digit 0 through 9

- *Fact:* Now that we know about two different kinds of numbers—binary and decimal—things will might become very confusing!

Task - Reflection

- Prompt: is 11 a binary or decimal number? How do you know?
- My response:



- fact: When we speak, it's easy to tell what kinds of numbers we are talking about; when we write them, it can be very confusing.

11

If this is a binary
number we say
“one one”

If this is a
decimal
number, we
say “eleven”

- fact: When we write we numbers, we will use *subscripts* to help us figure out what kind of number we are looking at.

11

If this is a binary
number we write

11_2

If this is a
decimal
number, we
write 11_{10}