

Name: _____ Date: _____

Not Enough Numbers

During the past few years, there have been several statements of the form
“it is conceivable that we may run out of area codes and telephone numbers within the next 10 years.”

The shortage of telephone numbers can be traced back to the turn of the century when the internet and cellphones became more universal across the country.

A telephone number in the form *NYZ-ABC-XXXX* has three sections:

NYZ
area code

ABC
exchange code

XXXX
station code

PRE1995

Before 1995, the world was a very different place. Cell phones were extremely uncommon and most families only had one phone line in their house. It was also common to not even have area codes if you lived in a small enough city. Your phone number would simply be 7 digits long. By 1995, home computers and the internet started to spread. In this time the only way to access the internet was to use a dial-up connection, meaning connecting your computer to a phone line. Many families started to get a second phone line to their house so they could have one phone line for calls and one phone line for the internet (because you couldn't use both at the same time)

During this time phone numbers had the following rules attached for generating area codes (the codes created based on location)

1) How many area codes were possible Pre-1995?

Area Code (NYZ)
N can be any digit 2-9
Y is either 0 or 1
~If Y is 0 then Z can be 1-9
~If Y is 1 then Z can be 2-9

POST 1995

By the late 90s and early 2000s cell phones started to become ubiquitous, even though smart phone usage would not become universal until the mid to late 2000s. As cell phones started to proliferate it meant that it was no longer one or two lines per family but rather a phone line for every *member* of the family. That meant the need for more and more phone numbers.

2) How many area codes are available today?

Area Code (NYZ)
N can be any digit 2-9
Y can be 0-8
Z can be 0-9
The codes 37Z and 96Z Are currently being saved for future use and are not currently in circulation

The other 7 digits of a phone number have the following rules when generating a new number

ABC	XXXX
~ A is any digit 2-9 ~B is any digit 0-9 ~C is any digit 0-9	~X is any digit 0-9

SPECIAL EXCEPTIONS

- B and C cannot both be equal to 1
- The phone number set 555-0100 through 555-0199 are not used because they are saved for fictional use in movies and television shows.

3) How many 7 digit numbers are available? (not including the area code...yet)

4) How many TOTAL phone numbers are possible (including the area code answer you got from number 2)

5) If we look up the current population of the United States, are we danger of running out of phone numbers?

6) The current US population is increase by about 1% each year. If this remains constant, how many years will it take before we run out of phone numbers?