Lesson 1 - Introduction

This presentation should help you understand:
Googology 1 – concept 1.1

Presentation made by Mr. A, for a googology canvas course.

What is googology really?

- Googology is the study (and nomenclature) of large numbers, it is a mixed field of math that includes everything from set theory, ordinal analysis, computer science, number theory, to graph theory.
- Googologist explore these fields of math, trying to find the greatest number within some set of limits.

What doesn’t count?

- Although we strive for the largest numbers possible, there are some limitations:
- Infinity obviously doesn’t count since it’s not a number in the traditional sense, and it wouldn’t be any fun if we focused on it.
- You also can’t use “The largest number anyone can think of plus one.”, not only is this ill-defined & paradoxical, but it takes out all the fun of inventing new large numbers. Numbers constructed from the trivial combination of other numbers are called “salad numbers”.

Why is googology important?

- From Lawrence Hollom: “Is there a reason we do things like read a novel or go to an art museum, if we're not going to get much useful out of it? No, but we still do because we enjoy doing those kinds of things. Therefore, does there need to be a reason to read about ridiculously large numbers other than because you want to? I think not.”

Where does the name come from?

- Googology was coined by Andre Joyce, formed from adding “googol” (10^{100}) and “logy” (study). This term became popular due to its use by the Googology Wiki.
- Other terms: googologism - “mathematical object relevant to googology”; googolism - “numbers, more specifically names for numbers”.
- “googol” was coined in 1920 by 9-year-old Milton Sirotta.

Some googology history:

- The earliest known work by a "googologist" is probably the "Sand Reckoner" written by Archimedes, sometime in the 3rd century B.C. It develops a system of number up to $10^{8 \cdot 10^{16}}$).
- Many googologists have existed, sometimes they don’t even consider themselves googologists.
- Most googologism either: Came from professional mathematics, were made for recreation by mathematicians, or were made by amateurs.

A few Important googologists:

- In general mathematics: Donald Knuth: made Knuth up arrow notation, Harvey Friedman: made TREE[n] and SCG(n), John Conway: made Conway’s chained arrow notation.
- In the community: Aarex Tiaokhiao: invented extensions to other notation, Agustin Rayo: invented rayo(n) one of the fastest growing functions, Andre Joyce: coined the word "googology" and made some googolisms, Chris Bird: invented Bird's array notation and helped develop BEAF, Jonathan Bowers: made BEAF, Lawrence Hollom: invented hyperfactorial array notation, Nathan Ho: Founded Googology Wiki, Sbiis Saibian: invented the Extensible-E System.