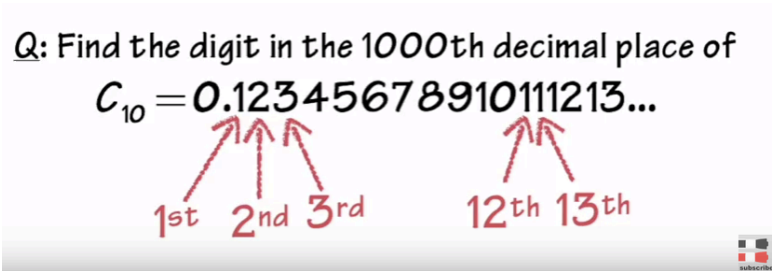
Mathletes Problem of the Week #5

The Champernowne Constant



The Champernowne Constant is a number described by mathematician D.G. Champernowne in 1933. It is an irrational number like π and $\sqrt{2}$. It is created by writing a zero and a decimal point and then writing out the whole numbers in order after that (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11...). It is an interesting number because easy to predict what the next digit will be, but it is difficult to determine what digit will be in a specific position of the number.

a) What is the 50th digit after the decimal point in the Champernowne Constant?
b) What is the 100th digit after the decimal point?
c) What is the 1,000th digit after the decimal point?

(This week's challenge was inspired by YouTuber blackpenredpen who challenged viewers to create a video to show their solution to the above question.)

Solutions & Explanations: (Try one or try them all! Record your solutions and explanations below and on the back.)

Name _____ **Class** _____

(First and last name, please!) **Solutions due: November 15th**