

Mayan Math

Math was a part of the Mayan culture for thousands of years. Their number system was similar to ours in that they had place value, but different in that they wrote their numbers vertically instead of horizontally. Where we use ten symbols, they only used three to represent all numbers:



zero



one



five

They used a stone or dot to represent one, a bar or stick to represent five, and a shell to represent zero. Using just these three symbols they were able to write all the numbers and do simple arithmetic.

1. What numbers do these Mayan symbols stand for?





















a) ● ● ● =

b) ● ● ● ● =

c)  =

Solution: a)3 b)4 c)6

2. In the following table, you can see how the first 19 numbers are written:

				
0	1	2	3	4
				
5	6	7	8	9
				
10	11	12	13	14
				
15	16	17	18	19

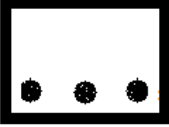
3. Identify the following Mayan numbers:


$$\begin{array}{c} \bullet \\ \bullet \\ \hline \hline \end{array} = 7 \quad \begin{array}{c} \hline \hline \hline \hline \end{array} = 10$$


$$\begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \bullet \end{array} = 4 \quad \begin{array}{c} \bullet \\ \hline \hline \hline \hline \end{array} = 16$$


$$\begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \hline \hline \end{array} = 13 \quad \begin{array}{c} \hline \hline \hline \hline \hline \hline \end{array} = 15$$


4. Write the following numbers using Mayan symbols:

a. 3 = 

b. 8 = 

c. 14 = 

d. 15 = 

e. 18 = 

Mayan numbers have a base 20 instead of a base 10 which we are familiar with to:

- The first place (the bottom row) has a value of 1.
- The second place (second row from the bottom) has a value of 20.
- The third place (third row from the bottom) has a value of $20 \times 20 = \underline{400}$, and so forth.

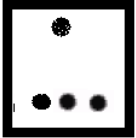
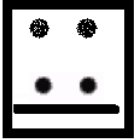
For example, this is how we would write the number 54 (We know $54 = 40 + 14$):

• • **→ Second Place: 2 x 20 = 40**





















≡≡≡ **→ First Place: 14 x 1 = 14**

5. The first place (bottom) has 14 group(s) of **ones** and the second place (top) has 2 group(s) of **twenties**.

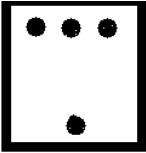

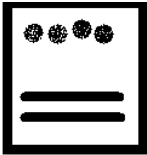

6. Write these numbers in Mayan notation:

Number	# Groups	Mayan Notation
a. 23	has <u>1</u> group(s) of 20 has <u>3</u> group(s) of 1	
b. 47	has <u>2</u> group(s) of 20 has <u>7</u> group(s) of 1	





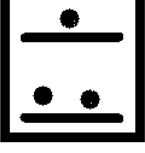
7. Below is a table of Mayan numbers 20-39. Fill in the missing numbers:

									
20	21	22	23	24	25	26	27	28	29
									
30	31	32	33	34	35	36	37	38	39

8. Write these numbers in Mayan notation:


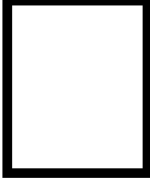
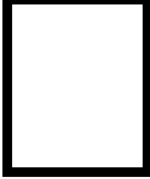
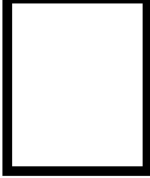
Number	Mayan Notation
61	
47	
90	
156	

9. Convert these numbers from Mayan Notation to our (Base 10) notation. The first one is done for you.

Mayan Notation	Number
	110
	27
	67
	112
	127

Homework:

Write out the ages of everyone in your family using Mayan Notation. Next week, you will share your worksheet with a classmate who will find out how old everyone in your family is! I have done an example for you.

Name	Age in Mayan Notation	Age in Numbers
Boo (Katja's Dog)		
		
		
		

Name	Age in Mayan Notation	Age in Numbers
	