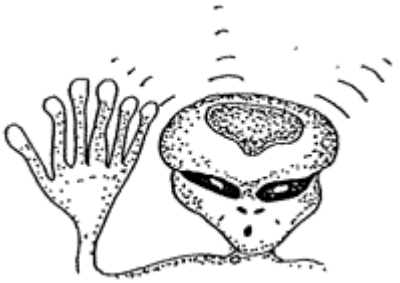
Martian Counting

In the year 2107 it is quite common for school children to spend a year on Mars in a student exchange program. On your first day at Martian school you realise that the symbols they use for counting are different to the system you are familiar with. Your new teacher tries to help you understand the symbols they use by drawing some diagrams.



Step 1:

Can you fill in the missing entries in this table? Note that the O's are the straws end on and the (OOOOOO)'s are bundles of 6 straws.

O	1	(OOOOOO) O	11	(OOOOOO) (OOOOOO) O
OO	2	(OOOOOO) OO	12	(OOOOOO) (OOOOOO) OO
OOO	3	(OOOOOO) OOO	13	(OOOOOO) (OOOOOO) OOO
OOOO	4	(OOOOOO) OOOO		(OOOOOO) (OOOOOO) OOOO
OOOOO	5	(OOOOOO) OOOOO		(OOOOOO) (OOOOOO) OOOOO
(OOOOOO)	10	(OOOOOO) (OOOOOO)		(OOOOOO) (OOOOOO) (OOOOOO)

Step 2:

After completing this table, you think about the number of fingers that Martians have (6) and realise that their system is really very similar to the one you use on Earth. Your new teacher now gives you some **addition** problems to do. Have a try! (The Martian children use rubber bands to make bundles of straws to show the number). The first one is done for you.

5	2	5	13	15	21	123
+1	+3	+14	+4	+33	+44	+45
10						

Step 3:

Next comes **subtraction**: (you may need to use the straws again). The first one is done for you.

12	5	24	23	35	543
-3	-4	-12	-14	+15	-231
5					

Step 4:

Use straws to help you to fill in the following **multiplication** table. Some are already done for you.

*	0	1	2	3	4	5	10
0				0			
1			2				
2					12		
3				13			
4			12				
5						41	
10		10	20				

Step 5:

When the teacher tries to explain **division** you realise that Martians use a system rather like our decimals but they write the symbol **:** (pronounced 'dit') when the parts are smaller than one. Look at the following divisions and see if you understand them (use straws again).

12 ÷ 2 = 4 23 ÷ 3 = 5 2 ÷ 4 = 0:3 2 ÷ 10 = 0:2 13 ÷ 2 = 4:3

Step 6:

Minka, one of the Martian children, is having trouble with the number 000120:3000. She is unsure whether it is correct to write as 12:3, leaving out all the zeros. What can you say to help her?

Step 7:

Monto is another student in your class. He is trying to make sensible answers by rounding some of his results. First he needs to round 531**:**41 to the nearest whole number. Can you think of a rule for rounding to help him?

Try rounding these to the nearest whole number:

21:45 3:153 14:354 15:354