Colour all the multiples of 9

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

What pattern do you notice?

Complete the number tracks.

0	9	18	27	36	45	54	63

108	99	90	81	72	63	54	45	36

These numbers are all multiples of 9

45 **54** **18** **108**

a) Show that the sum of the digits of each number is the same.

4+5=9 5+4=9 1+8=9 1+0+8=9

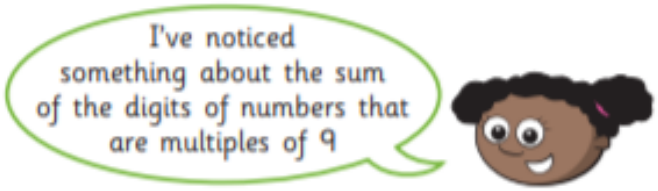
b) These numbers are also multiples of 9

198 **657** **891** **999**

What is the sum of the digits of each number?

1+9+8=18 6+5+7=18 8+9+1=18 9+9+9=27

c)



What do you think Whitney has noticed?

The digits add to another multiple of 9

d) 7,59_ is a multiple of 9

What is the missing digit? 6

Jack is making arrays.

a) Use the arrays to complete the multiplications.

1 × 10 = 10	1 × 9 = 9
2 × 10 = 20	2 × 9 = 18
3 × 10 = 30	3 × 9 = 27
4 × 10 = 40	4 × 9 = 36

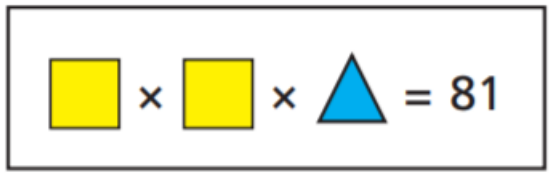
b) Write steps for a partner to explain how you can use the 10 times-table to multiply by 9

Multiply by 10 then subtract one lot of the number. E.g. $15 \times 9 = 15 \times 10 - 15 \times 1 = 150 - 15 = 135$

c) Use your steps to work out these multiplications.

19 × 9 = 171	72 × 9 = 648

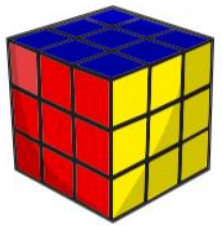
Here is a number puzzle.



Find three different values of the square and triangle.

△ = 1	△ = 9	△ = 81
□ = 9	□ = 3	□ = 1

There are 9 coloured squares on each face of a puzzle cube.



How many coloured squares are there on the whole puzzle cube?