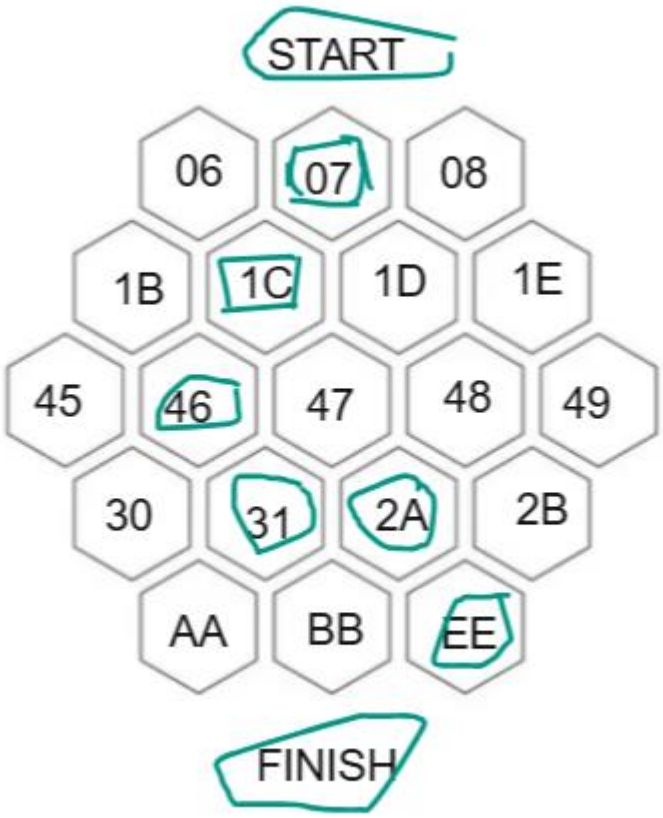
Hexadecimals and Binary

Activity 1



Activity 2

3rd column is 16 squared

256	16	1

Decimal	283	4095	4096	17	88	740
Hexadecimal	11B	FFF	1000	11	58	2E4

Activity 3

Find the sum of 3A5 + 2D1 by converting to decimal, doing the addition and converting back to hexadecimal.

$3A5 = 3 \times 256 + 10 \times 16 + 5 = 933$

$2D1 = 2 \times 256 + 14 \times 16 + 1 = 721$

$933 + 737 = 1654$

Then $1654 \div 256 =$ **6** with remainder 118

$118 \div 16 =$ **7** with remainder **6**

So the answer is 676

Can you do it without converting?

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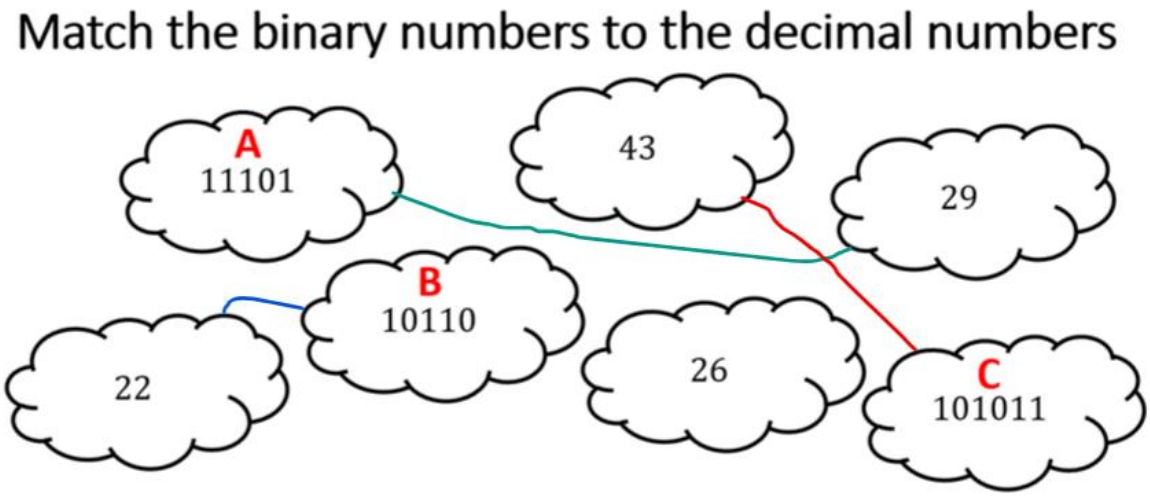
  3A5
+2D1
_____
  676
```

Because 5+1 = 6, A +D is 10 +13 = 23. In hexadecimal this is too big for one digit, so carry one 16 to the next column leaving 7, then 3+2+1=6.

Activity 4



Because one block of four binary numbers represents one hexadecimal number it is easy for programmers to visualise numbers in hexadecimal. Programmers sometimes use words written in hexadecimal in their programs.

Activity 5

What word is this?

1101 1110 1010 1101 1011 1110 1110 1111

Convert each block to a hexadecimal digit and you get:

DEADBEEF

Activity 6

Find the missing number

10000, ? , 100, 31, 24, 22, 20, 17, 16, 15, 14, 13, 12, 11, 10

These all represent the number 16 in different bases, from 2 – 16 (binary up to hexadecimal)

So the missing number needs to be in base 3

9	3	1
1	2	1