CF:PUZZLEBOOK.22

CyberFirst Girls Competition Final 2022

CONTENTS

INTRODUCTION

Congratulations and well done for reaching the final of the CyberFirst Girls Competition 2022!

This puzzle book is full of extra puzzles for your team to solve – please make sure you read this page so that you know how to find the challenges and submit the flags within the online platform to get the extra points!

Challenges can be identified on the online platform by the following naming convention**: PuzzleBook.22 – Challenge Title**
You can check which category they will be under using the contents page on page 1.

To reveal all of the PuzzleBook.22 challenges, look for:
"**PuzzleBook.22 – Introduction**" within the competition platform.
We can see on the contents page of this book that this challenge will be under the *Speciality* category.

When you have found this challenge in the competition platform, you will be able to work out the flag and submit it as normal. Once you have completed the introduction challenge, all the other PuzzleBook.22 challenges will be unlocked within the platform!

You may have already noticed some of our **HiddenFlag.22** challenges… Make sure you complete the speciality challenge "**HiddenFlag.22 – Introduction**" to unlock them within the competition platform.

Good luck challengers!

THE DOTTED LINES

We're pretty sure that you've deciphered codes like these before – You know the drill!

SOLVE THE CHALLENGE AND GET THE FLAG!
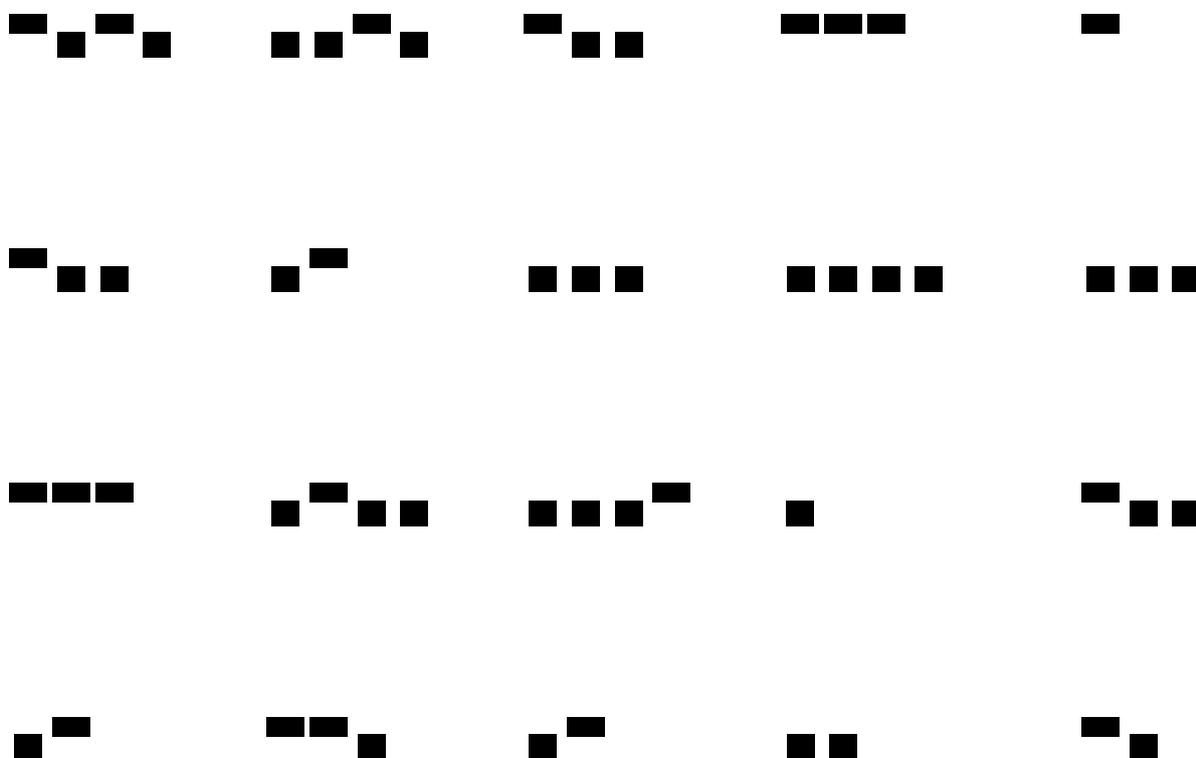
YOU SNOOZE, YOU LOSE

I kept hitting the snooze on my alarm clock and I REALLY overslept today...

Can you work out what time my final alarm went off?
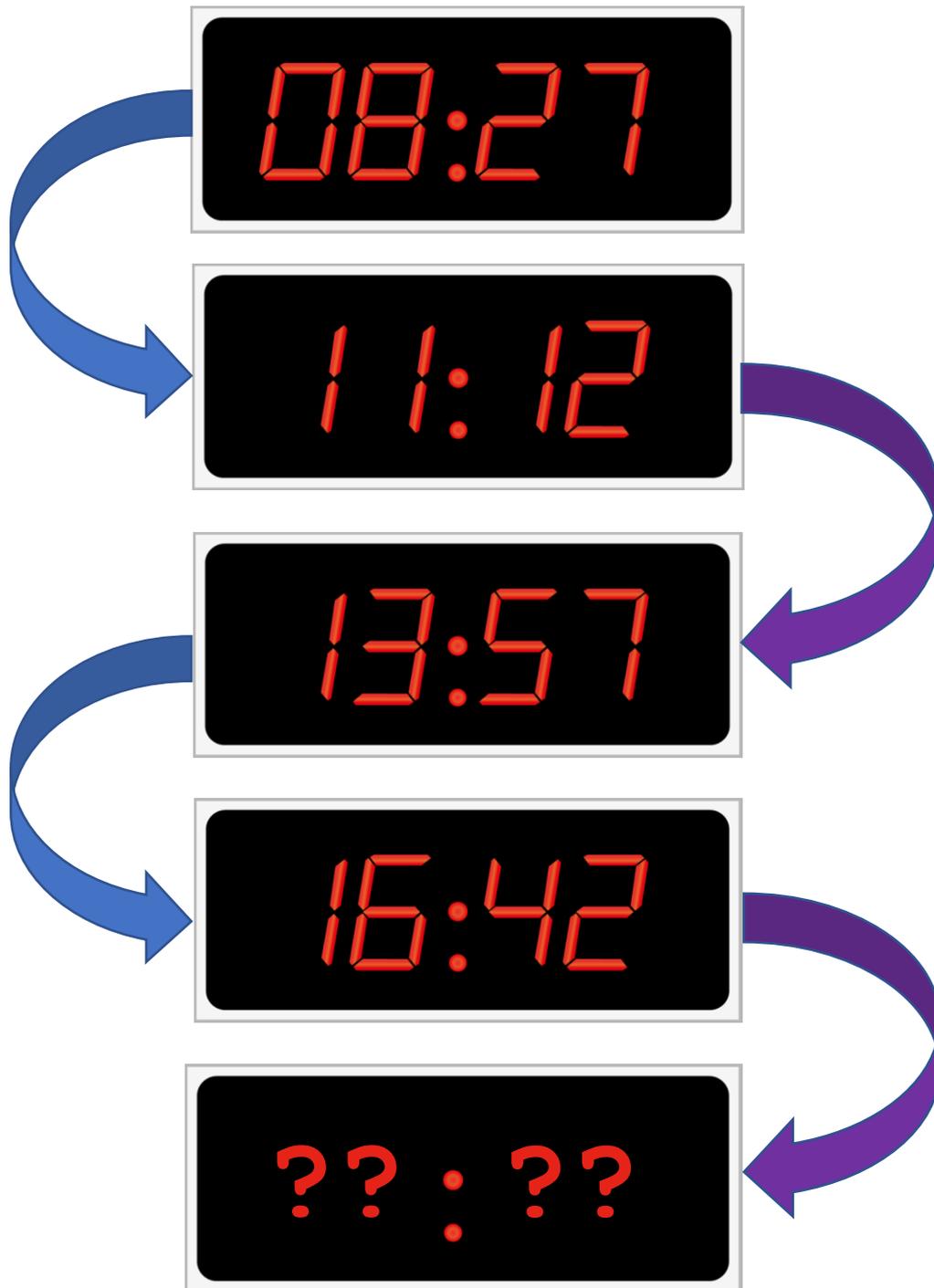
CYBERCHEF'S SECRETS

The list of secret ingredients that CyberChef uses has been muddled up into a wordsearch to try and prevent others stealing CyberChef's recipes! To make sure the secret ingredients all stay a secret, CyberChef replaced all of the labels with MD5 hashes, with a pinch of salt...

Now CyberChef can't find anything!

For example: If the secret ingredient was soy sauce, the string (in all caps with no spaces) would be: **SOYSAUCESALT**

A MD5 hash of this string would be created and so the new label on the bottle would read: **6d0056165271414a17567c7d2a458e5a**

CAN YOU FIND THE INGREDIENTS IN THE WORDSEARCH AND REMIND CYBERCHEF WHAT INGREDIENT HAS THE LABEL B9004A41B928DCDB6230E96983AD863A ?

```
P  Y  L  S  Q  S  S  P  B  V  I  N  E  G  A  R  F  G
S  N  G  E  F  P  R  C  R  Q  W  M  A  F  C  C  W  L
P  K  J  A  B  K  L  O  E  H  Z  S  Y  M  H  C  A  Y
A  F  K  W  E  M  E  F  A  P  M  H  Q  E  A  I  S  Q
B  Q  Q  E  E  A  W  F  D  A  I  C  Q  M  R  N  A  G
A  N  Q  E  S  R  C  E  C  R  N  Y  S  G  I  N  B  A
S  C  X  D  W  M  H  E  R  M  T  A  L  H  S  A  I  R
I  F  E  E  A  I  T  H  U  E  T  C  Y  R  S  M  G  L
L  L  C  A  X  T  U  N  M  S  K  F  T  O  A  O  K  I
L  D  R  C  Z  E  N  G  B  A  G  A  M  N  W  N  Z  C
H  L  L  S  G  H  W  D  S  N  M  A  N  G  O  S  R  Y
Q  C  H  I  P  O  T  L  E  Z  O  Y  C  H  R  H  Y  H
```
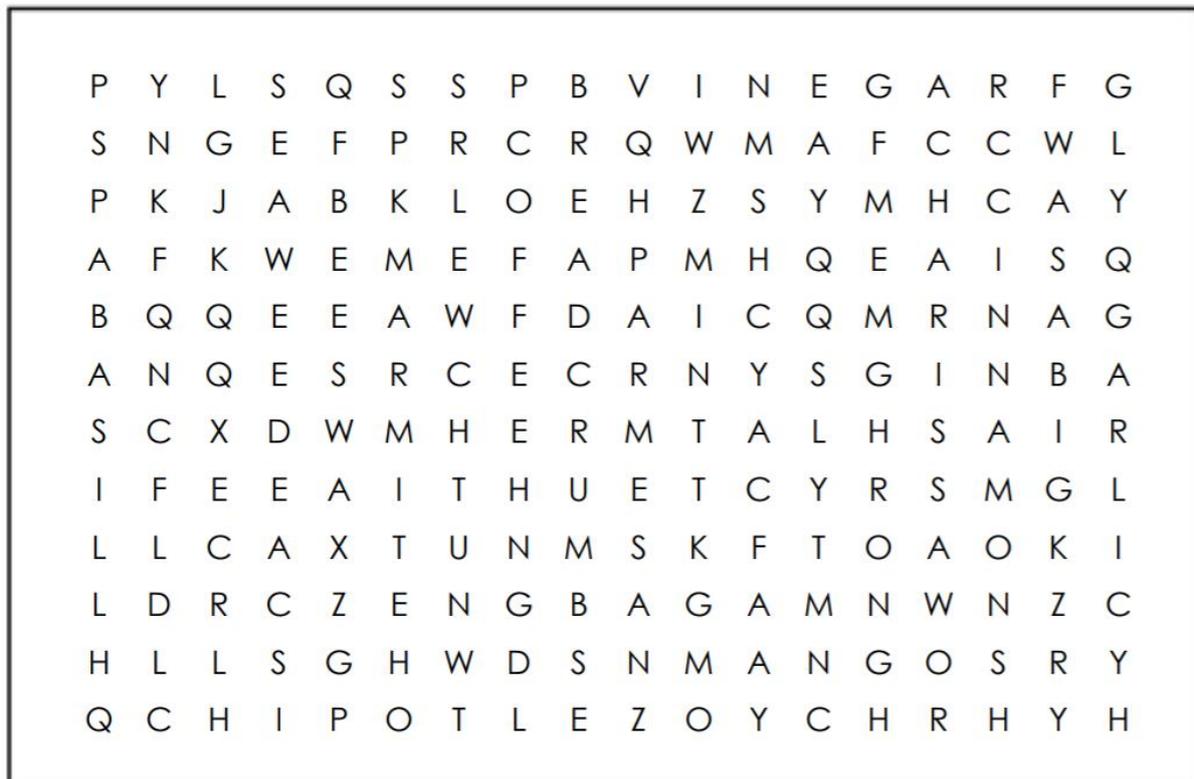
RICHARD'S COLOURFUL PIN

Richard knows his username: @RichardY07 but has forgotten the 4-digit pin he set up to access his online banking.

My Pin Reminder

Violet

Green

Orange

Blue

SIMPLY SUDOKU

A sudoku is a 9x9 grid, which is divided into 9 smaller blocks of 3x3 which are called nonets. To solve the sudoku, you must fill in the numbers so that each column, row and nonet contains the numbers 1,2,3,4,5,6,7,8,9 (in any order) exactly once – no repetition allowed!

THE FLAG IS THE NUMBERS IN THE GREEN SHADED BOXES LISTED IN ORDER FROM THE TOP TO BOTTOM

	6	1			9		3	
9		2			7		6	8
4	8		2		3	1		9
1		7	6					2
6				1	5		4	
	4			8	2		1	7
3	7				6	8		1
2	1			7		3	5	6
	5	6	3	9			2	4

DOES THIS ADD UP?

a = THE YEAR THAT CYBERFIRST WAS FOUNDED
(__ __ __ __)

b = THE YEAR THAT ADA LOVELACE WAS BORN
(__ __ __ __)

c = THE YEAR THAT NINTENDO WAS FOUNDED
(__ __ __ __)

d = THE MINECRAFT VERSION WHERE AXOLOTLS
WERE FIRST INTRODUCED (**1.17**)

e = THE NUMBER OF 1ST GENERATION POKEMON
(**151**)

f = THE YEAR THAT THE FIRST IPHONE WAS
RELEASED (**2007**)

g = THE YEAR THAT SNAPCHAT WAS CREATED?
(__ __ __ __)

h = WINDOWS 1 RELEASE YEAR (__ __ __ __)

Answer = 1

```
if h < c:

    Answer = Answer + 924


if (d * g) < (790 * 3):

    Answer = 4


if (a / e) > (a - b):
    Answer = Answer * 33


if f == (g - 4):

    Answer = Answer * 57


if (b + 100) > a:

    Answer = Answer + 42


if g < (f * d):

        Answer = Answer - 222


if (c + e) == (h + 55):

    Answer = Answer * e
```

WHAT IS THE FINAL VALUE OF ANSWER?

SILLY STRINGS

*Compression is used to make files smaller using the properties of the underlying data - IIn text files, one of those properties is repeated strings (sequences of characters). Computers can a file smaller by getting rid of repeated strings and keeping track of what **should** have been there… So the text file will still look the same when we open it!*

"Th**is is** an example" contains the string "**is** " twice.
A simple compression scheme would replace the second "**is** " with "Go back 3 characters and take 3 characters"

We could represent this as @(3,3) or @(distance, number of characters to take) so that the compressed string would look like this:
"Th**is @(3,3)**an example"

CONGRATULATIO@(11,1)S-REACHING-THE-FINALS-OF-@(14,3)-

CYBER@(19,2)RST-GIRLS-@(60,2)MPETI@(57,4)-WE-LOVE-

@(29,2)R@(62,3)S-AND-@(20,7)-POINTS-@(15,2)LL-

DO@(11,1)@(7,1)-CHA@(11,2)@(7,1)@(9,1)@(39,1)@(3,1)RS-

@(90,3)-FL@(16,1)@(12,1)-I@(12,1)-@(24,1)@(9,1)@(7,1)

@(15,2)@(44,2)@(5,1)@(32,3)R@(53,6)T@(8,1)@(15,3)

Hint: This challenge uses – instead of spaces to make it easier to count the characters, so make sure you count them! But don't count new lines as characters!

SECRET MESSAGING SQUAD

After competing in the qualifier round of the CyberFirst Girls Competition, one group decided to start using ciphers in their group chat to keep their conversations extra secret! This puzzle has multiple separate flags, submit each answer to the corresponding challenge!

Q1 – WHO OWNS THE PHONE THAT TOOK THIS SCREENSHOT?

Q2 – WHERE IS EM?

Q3 – WHERE ARE THEY MEETING?

NON-BINARY MATHEMATICS

A binary number is a number expressed in the base-2 numeral system, a method of mathematical expression which uses only two symbols: "0" and "1"

THE FLAG FOR THIS CHALLENGE IS THE SUM OF ALL THE NON-BINARY NUMBERS IN THE DATA BELOW

```
010101000110100001101001011100110010000011010010111001100100 20
001100001001080000011101000111001001100001011011100111550110110 1
101011010010111001101111001101101010010110111101101110001000000110
011001110010011011110110110100100000011011110111010101110100011
001010111001000100000011100110110111000001100001011000110110010100
101100001000000110000101101100011101000110100001101111011101010
71001110110100000100000011101110110100001100101011011100010000 0
011110010110111101110101001000000110000101110010011001010010000
001101001011011100010000001110011011100000110000101100011011001
010010110000100000011010010111001100100000011010010111010000100
000011100110110111010001101001011051000110110000100300031011110111
010101110100011001010111001000100000011100110110111000001100001011
000110110010100111110010000000100111101110010001000000111011101
101110111010101101100011001000010000001110010110111011101010
010000001106011011000010110110001101100001000000110100101110100
001000000010001001101001011011100110111001100101011100100010000 0
001110011011100000110000101100011011001010010001001311111001000
0001000001011011100111100101110111011000010111100100101100001 00
000011101110110010100100000011101110110000101101110011101000010
00000111010001101111001000000111011001101001011100110110110010111
10100000100000010001010110000101110010011101801101000001000010 0
100000010100110110010101901010010000001111001011011110111011010
01000000111001101101011101101110111011100010000001111000011011 11
011210000110111100000000000000000000000000000000030000000000
```
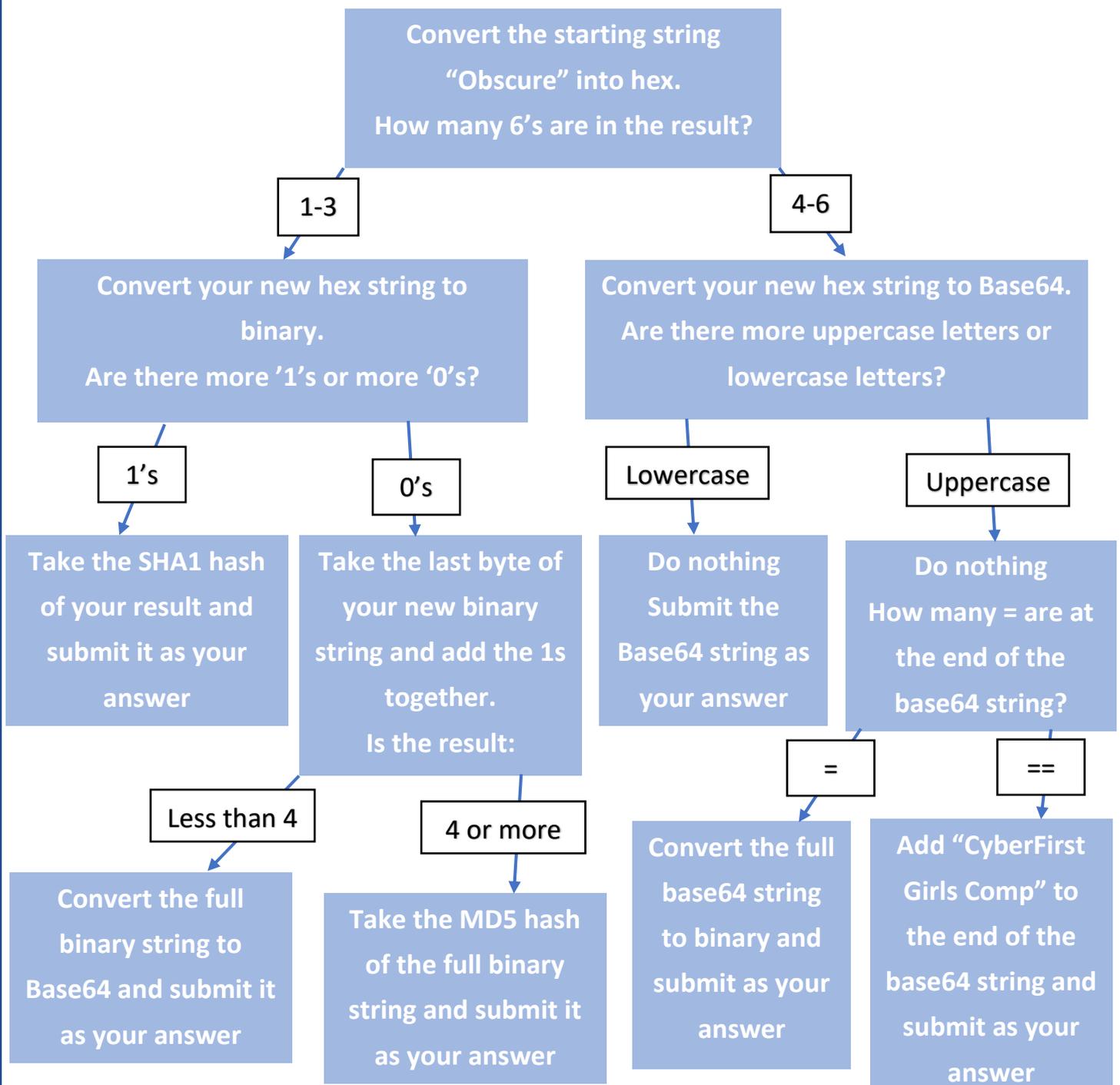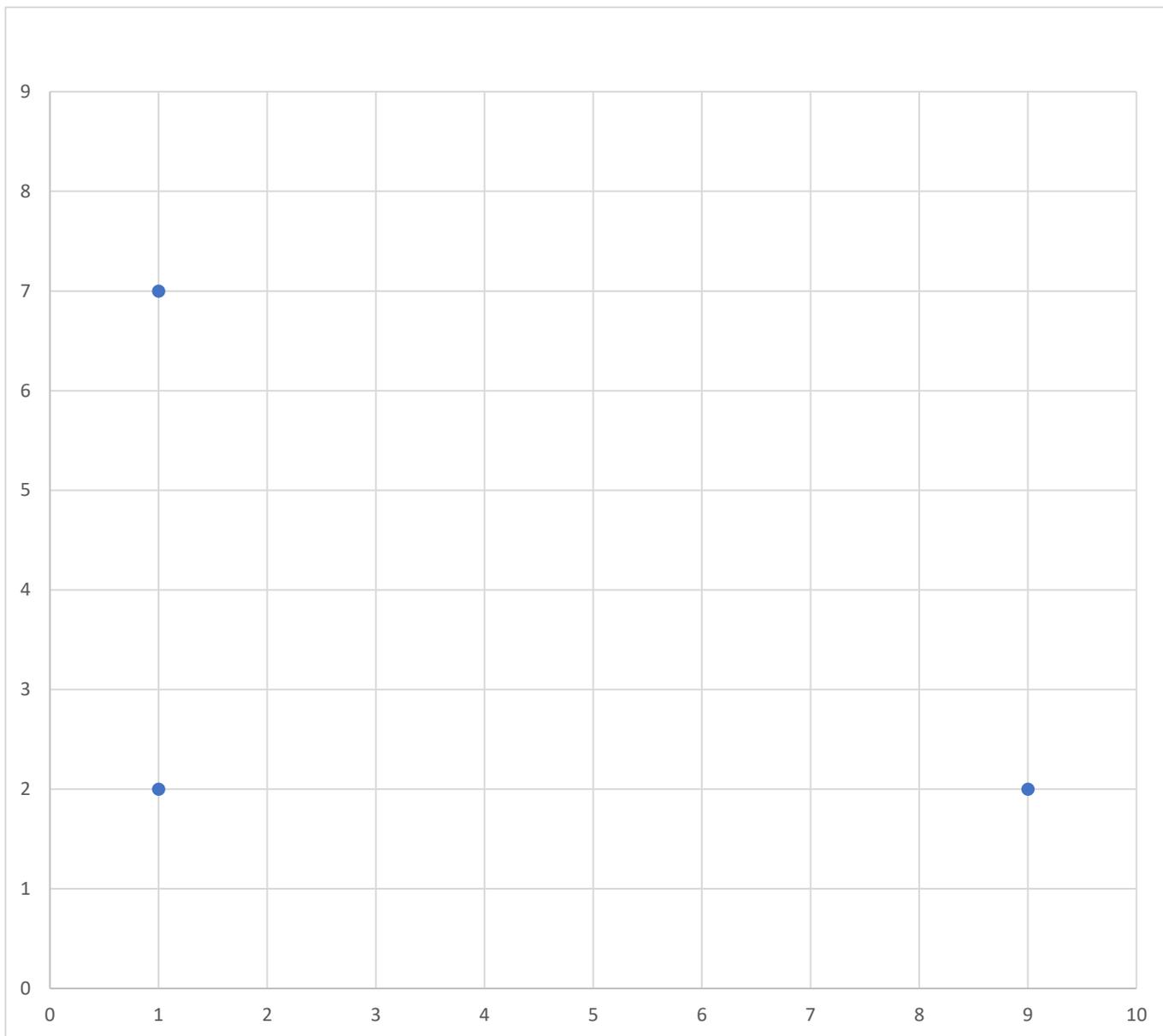
ROUTE TO GOAL

This challenge is a flow chart with a twist – you will need to follow the instructions to correctly manipulate the starting string. There are lots of possible end strings but only ONE correct answer! Be careful as you only have a limited number of submissions!

THE STARTING STRING FOR THIS CHALLENGE IS: **Obscure**

Convert the starting string "Obscure" into hex.
How many 6's are in the result?

1-3

4-6

Convert your new hex string to binary.
Are there more '1's or more '0's?

Convert your new hex string to Base64.
Are there more uppercase letters or lowercase letters?

1's

0's

Lowercase

Uppercase

Take the SHA1 hash of your result and submit it as your answer

Take the last byte of your new binary string and add the 1s together.
Is the result:

Do nothing
Submit the Base64 string as your answer

Do nothing
How many = are at the end of the base64 string?

Less than 4

4 or more

=

==

Convert the full binary string to Base64 and submit it as your answer

Take the MD5 hash of the full binary string and submit it as your answer

Convert the full base64 string to binary and submit as your answer

Add "CyberFirst Girls Comp" to the end of the base64 string and submit as your answer

IT'S A...

This challenge is a little bit like that gameshow, Catchphrase… Just say what you see!

(1,2)   (1,7)   (9,2)   (6,7)   (2.5,5)
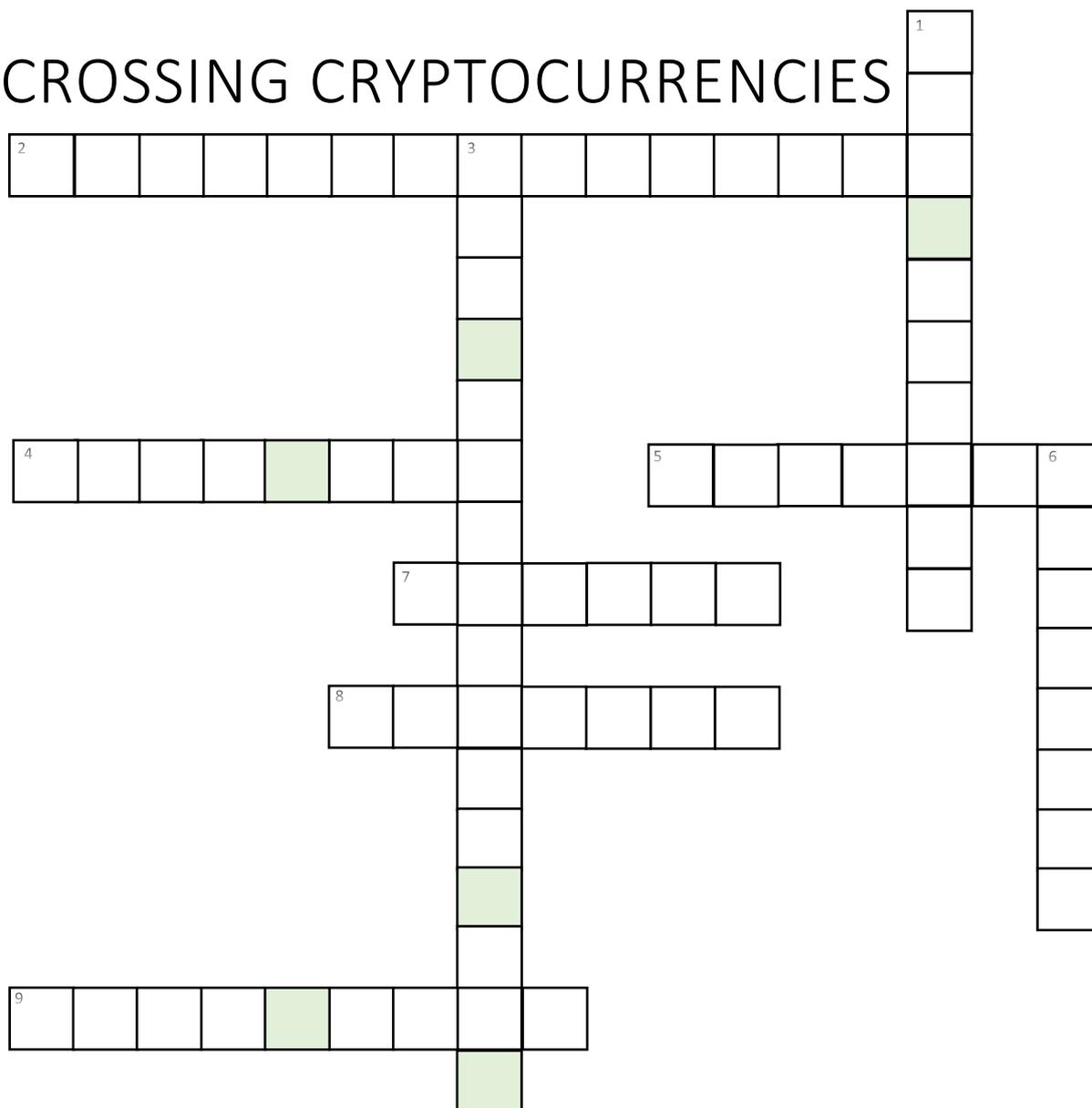
(7.5,5)   (9,7)   (5,5)   (4,7)   (5,2)

COLOURFUL CAPTCHAS

Spot the difference with a twist! Find the letters that are missing and use them to spell out the flag!

CROSSING CRYPTOCURRENCIES

2 ACROSS – THE ASSUMED PSEUDONYM OF THE CREATOR OF BITCOIN (7,8)

4 ACROSS – A CRYPTOCURRENCY CREATED BY IBM AND ADOBE SOFTWARE ENGINEERS AS A JOKE AND BASED ON A MEME (8)

5 ACROSS – THE TYPE OF KEY YOU USE TO ACCESS YOUR CRYPTO WALLET – IF SOMEONE ELSE FINDS THIS KEY THEY COULD STEAL YOUR COINS! (7)

7 ACROSS – HOW ARE BITCOINS "MADE"

8 ACROSS – ON 11/02/2018 THE NCSC RELEASED A STATEMENT ABOUT "_____" BEING USED TO ILLEGALLY OBTAIN CRYPTO COINS (7)

9 ACROSS – THE CODE THAT YOU SHARE WITH PEOPLE TO RECEIVE CRYPTO COINS INTO YOUR WALLET (6,3)

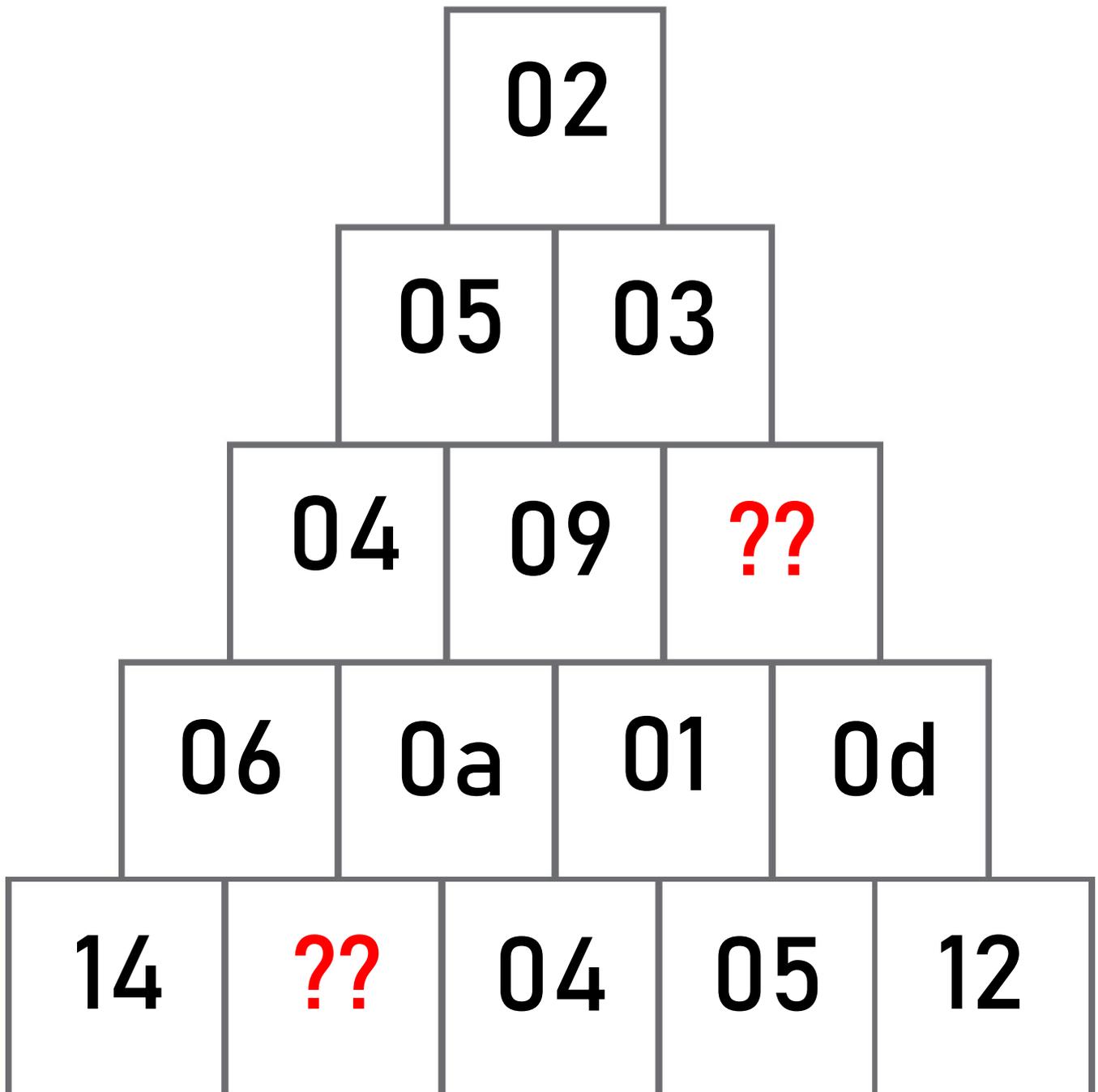**1 DOWN –** THE NAME OF THE DIGITAL LEDGER THAT STORES THE DETAILS OF THE TRANSACTION (10)

3 DOWN – A BLOCKCHAIN TECHNOLOGY THAT PROVIDES THE ABILITY TO ASSIGN OR CLAIM OWNERSHIP OF ANY UNIQUE PIECE OF DIGITAL DATA (3, 8, 5)

6 DOWN – ETH (8)

Use your skills to find the missing numbers

...wait, are those letters?

				02				
			05		03			
		04		09		??		
	06		0a		01		0d	
14		??		04		05		12

WHAT3WORDS MAKES1ANSWER?

This challenge might be a little bit tricky – there some hints available in the competition platform if you look up this challenge.
The flag for this challenge is something that everything in this list has in common.

///SHARE.SONG.FIRM

///SONGS.TREE.BEHAVE

///INVISIBLE.PILED.GRUB

///WALKS.EVER.POEM

///PURELY.GANGS.ARRANGES

///CADET.RISEN.BREATHED

///TANK.THROAT.COMMIT

///CAMP.SUMS.MOVIES

///KIOSK.READY.LATCHES

///TRAIN.NEST.BLAND

///DEFERS.KICK.AMPLIFIER

///MAINFRAME.NERD.DEAN

///ORANGE.CHEF.PIGS

///WELLS.SPIRIT.CAGE

///FREE.MINI.EXCHANGES

///ALBUM.SLUG.EDGY

///BEND.CAMPS.BEGINS

///CIRCLE.NEARLY.GRASS

///DISCO.HANDFULS.HOMELANDS

///BUYING.BRONZE.COMPOSED

///FINES.CHERISHED.GARAGE

///EVENLY.COUNT.ASSURE

///LONGER.BOOM.LEAGUE

///OLDER.TOOTH.CRUST

///MICROFILM.GLOSSED.PRINTERS

///ACHIEVING.OVER.WATER

///ARMFUL.GROUPING.HIRING

///AFFORD.SLAMS.TREES

///VACANCIES.LABEL.CRINGE

///LANDOWNER.LIVER.CHILLS