

Digital Schoolhouse & St. Mary's College, Derry

Paint by Pixels At Home Challenge

ST. MARY'S COLLEGE
Together we will shape your future



DIGITAL
SCHOOLHOUSE
together with

Student Name: _____

Primary School: _____ Year Group: P5 P6 P7

Parent/Guardian Name: _____

Email: _____

Contact Number: _____

CHALLENGE CLOSING DATE FRIDAY 19TH MARCH 2021

*** Please return your complete booklet via email to cdoherly7335@stmarys.derry.ni.sch.uk
or in hard copy to St. Mary's College, 35 Northland Road, Derry. BT48 0AN ***



Let's get started on Challenge 1 ...

Look carefully at the 8-digit binary code examples at the top of the page. Can you complete the rest?

Example:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |

Q1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

Q6

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| - | - | - | - | - | - | - | - |

Q11

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |

Q2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Q7

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| - | - | - | - | - | - | - | - |

Q12

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Q3

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Q8

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| - | - | - | - | - | - | - | - |

Q13

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |

Q4

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |

Q9

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| - | - | - | - | - | - | - | - |

Q14

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

Q5

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

Q10

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| - | - | - | - | - | - | - | - |

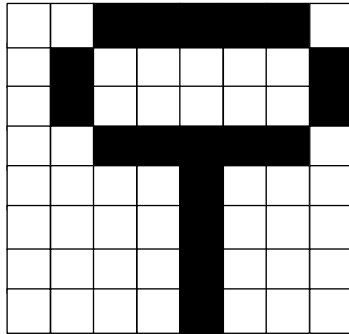
Q15

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

Challenge 2

Let's introduce 8 by 8 – it is a little more complicated, but you can do so much more!

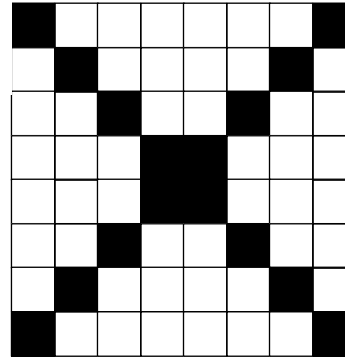
Example:



```

0 0 1 1 1 1 1 0
0 1 0 0 0 0 0 1
0 1 0 0 0 0 0 1
0 0 1 1 1 1 1 0
0 0 0 0 1 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 1 0 0 0
    
```

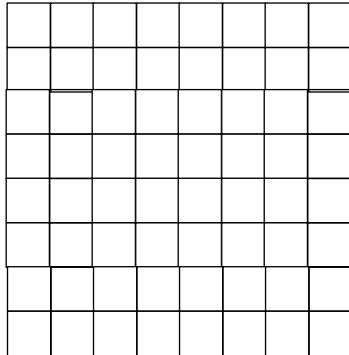
Q16



```

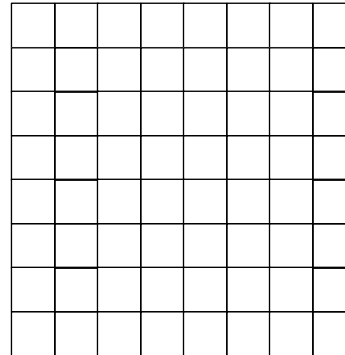
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
- - - - -
    
```

Q17



```

1 1 0 0 0 0 1 1
1 1 0 0 0 0 1 1
1 1 0 0 0 0 1 1
1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1
1 1 0 0 0 0 1 1
1 1 0 0 0 0 1 1
1 1 0 0 0 0 1 1
    
```



```

1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0
    
```

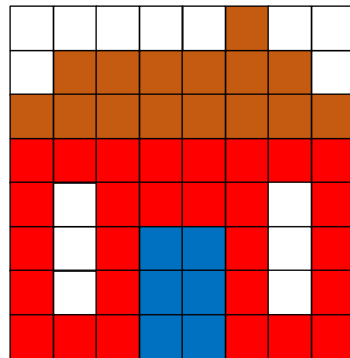
Can you see what two letter word we are trying to say in Q17?

Challenge 3

Now it time to think about colour ... 1 bit per pixel allows you to do black and white images using 1 and 0.

BUT if you add 2 bits per pixel you can have four different colours.

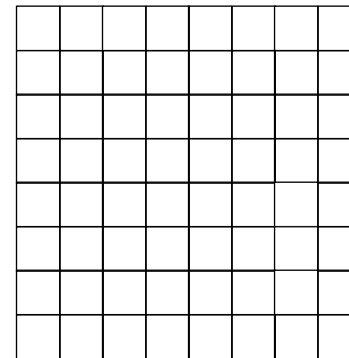
Example:



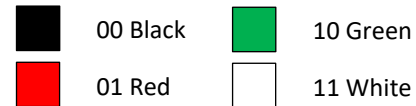
```
00 00 00 00 00 11 00 00
00 11 11 11 11 11 11 00
11 11 11 11 11 11 11 11
01 01 01 01 01 01 01 01
01 00 01 01 01 01 00 01
01 00 01 10 10 01 00 01
01 00 01 10 10 01 00 01
01 01 01 10 10 01 01 01
```



Q18



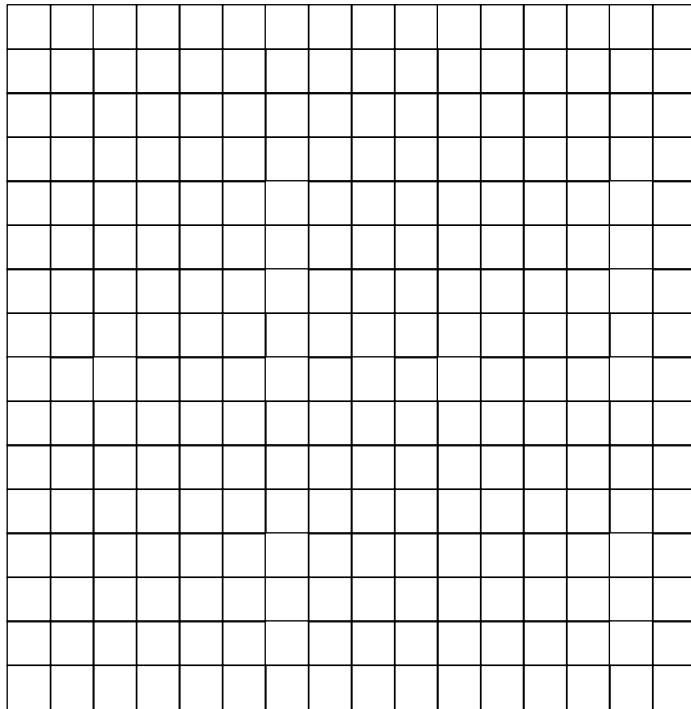
```
11 11 00 00 11 11 11 11
11 11 11 00 10 11 11 11
11 01 01 01 10 10 01 11
01 01 01 01 10 10 01 01
01 01 01 01 01 01 10 01
01 01 01 01 01 01 01 01
11 01 01 01 01 01 01 11
11 11 01 01 01 01 11 11
```



FINAL CHALLENGE & Competition Task!

Using the template below complete your own four colour pixel image and code. Use your imagination to impress the judges.

Selected colours and codes: 00 10
 01 11



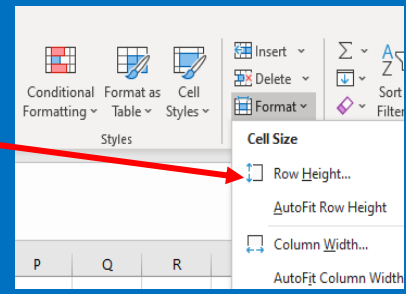
Briefly explain the image you picked and why? _____

Do you have access to a computer? Open a spreadsheet program like Microsoft Excel ...

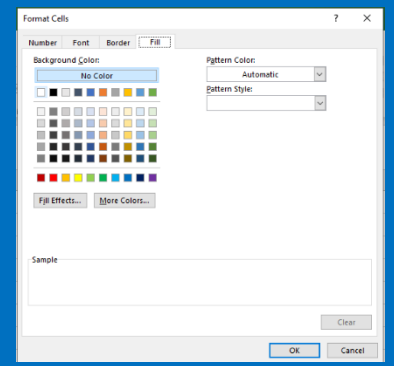
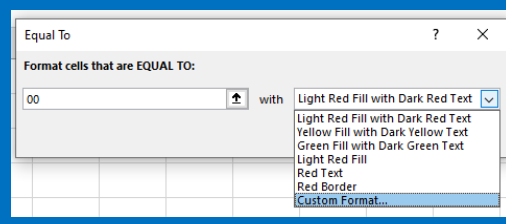
Step 1 Highlight the number of cells you need for your design.

Step 2 Change the cells to squares

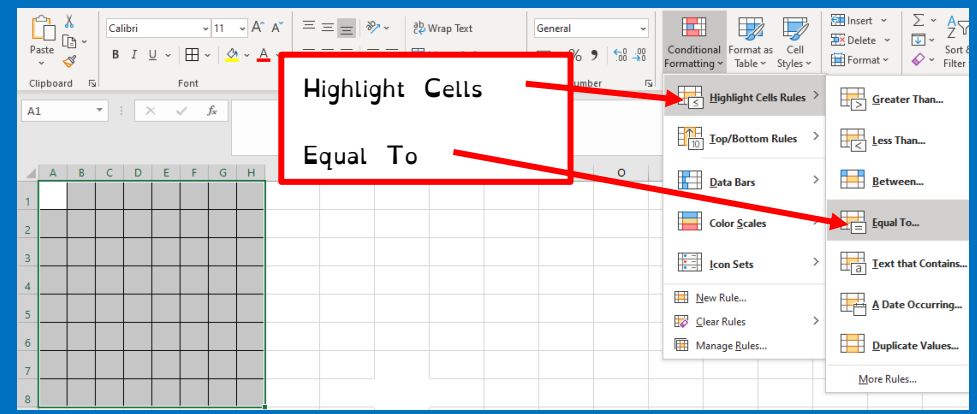
Row Height : 25
Column Width: 4



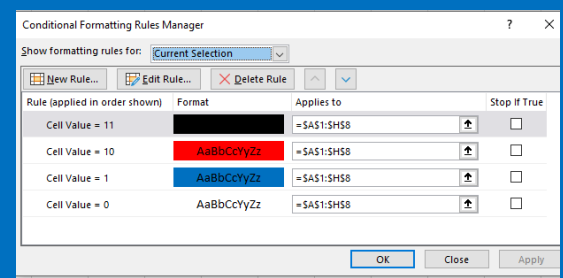
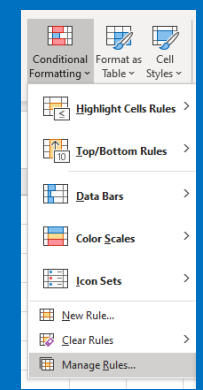
Step 4 Input 00
(dropdown_) Custom Format WHITE



Step 3 Conditioning Format



Step 5 Repeat Step 4 for 01, 10 & 11 for your selected colours.



Congratulations on completing the Paint by Pixels Challenge!

Step 6 Manage Rules to check your assigned colour codes.