

ICT Innovators

Pioneer of Computer Programming

Dr. Mark Dean



1957–

Computer scientist and engineer Mark Dean developed several ground-breaking technologies for IBM, including the first colour monitor for PCs, and the first gigahertz processor chip. From an early age, Dr. Dean demonstrated a love for building things, constructing a tractor from scratch with the help of his father. Dr. Dean excelled as an athlete and as a student, in 1979 he graduated at the top of his engineering class at the University of Tennessee.

Dr. Dean is credited with helping make personal computers (PCs) more accessible and powerful. He invented the Industry Standard Architecture system bus with Dennis Moeller, which allows for plug-in devices such as disk drives, monitors and printers to connect to computers.

Dr. Dean’s research at IBM also helped change the accessibility and power of the personal computer. In 1999, he led a team of engineers at IBM to create the first one gigahertz processor chip—a revolutionary piece of technology able to do a billion calculations a second.






After more than 30 years at IBM, Dr. Dean left the company in 2013 and is now teaching at the University of Tennessee as a John Fisher distinguished professor.

“

To break through, you often have to be better than the rest. This takes a lot of work, but it is achievable. I would also suggest young people consider emerging areas of opportunity: bio-engineering, civil engineering, nano-technology, analytics, security, sensor technology, material science.

Dr. Mark Dean

A lot of kids growing up today aren’t told that you can be whatever you want to be. There may be obstacles, but there are no limits.

Fast facts		
<div>Dr. Dean holds more than 20 patents, including three of IBM’s original nine patents for PCs</div> <div></div>	<div>Named an IBM Fellow in 1996 and honoured with the Black Engineer of the Year President’s Award and inducted into the National Inventors Hall of Fame in 1997</div> <div></div>	
<div>Dr. Dean predicted, in the '90s, that in 10 years magazine-sized tablets would replace PCs</div> <div></div>	<div>Had the foresight to advise IBM to shift away from PCs and focus on projects like the Watson supercomputer</div> <div></div>	<div>In 2001, became a member of the National Academy of Engineers</div> <div></div>

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Activity: Hexadecimal Colours

RGB Colour Model

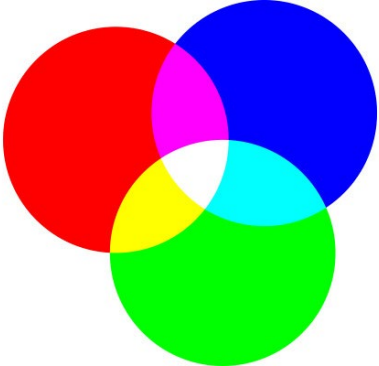
An additive colour model is used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours.

Each pixel displays a different amount of each light depending on the RGB value (from 0-256). In a computer code this is represented by a six digit hex code. To represent as a code we use a base 16 system to account for all the colour values higher than 99.

R

G

B



hex #3E28D9

$3 \times 16^1 = 48$
 $14 \times 16^0 = 14$
 $48 + 14 = 62$
RED = 62

$\begin{matrix} \times \\ \times \\ + \end{matrix}$
GREEN =

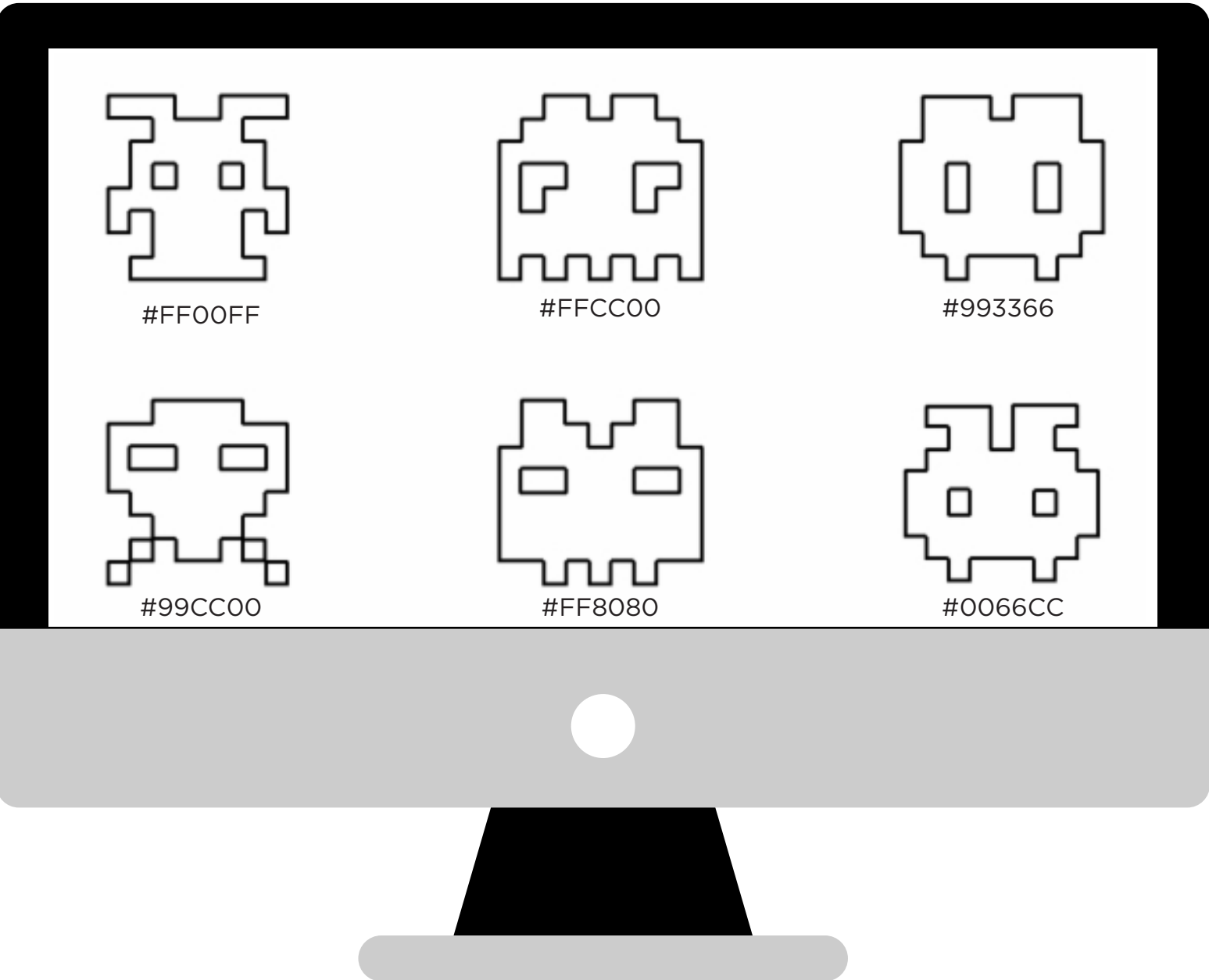
$9 \times 16^0 = 9$
 $13 \times 16^1 = 208$
 $208 + 9 = 217$
BLUE = 217

Key

0
1
2
3
4
5
6
7
8
9
A=10
B=11
C=12
D=13
E=14
F=15

Coding for Colour

On the screen below, there is an image that needs colouring. You have been given three hex codes you will need to decipher. Use the table to identify the colour for each part of the image.



#FF00FF

#FFCC00

#993366

#99CC00

#FF8080

#0066CC

RGB(0,0,0)

RGB(255,255,255)

RGB(255,0,0)

RGB(0,255,0)

RGB(0,0,255)

RGB(255,255,0)

RGB(255,0,255)

RGB(0,255,255)

RGB(153,153,255)

RGB(153,51,102)

RGB(255,255,204)

RGB(204,255,255)

RGB(102,0,102)

RGB(255,128,128)

RGB(0,102,204)

RGB(204,204,255)

RGB(0,0,128)

RGB(0,0,255)

RGB(0,204,255)

RGB(204,255,255)

RGB(204,255,204)

RGB(255,255,153)

RGB(153,204,255)

RGB(255,153,204)

RGB(204,153,255)

RGB(255,204,153)

RGB(51,102,255)

RGB(51,204,204)

RGB(153,204,0)

RGB(255,204,0)

RGB(255,153,0)

RGB(255,102,0)

Images: Vectors from www.freepik.com RGB Colours [Image] (n.d.). Retrieved from <https://excelatfinance.com/xlf/xlf-colors-1.php> RGB for the screen [Image] (n.d.). Retrieved from <https://blog.foto-lia.com/us/2015/03/26/cmyk-rgb-or-pantone/> Space Invaders colouring pages [Image] (n.d.). Retrieved from https://www.sccpre.cat/show/xxwhoR_space-invaders-coloring-pages/ (n.d.).



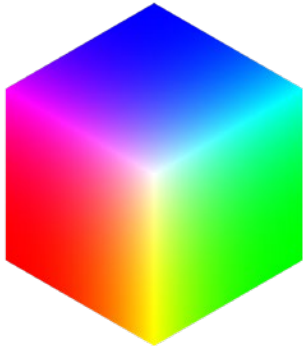
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Activity: RGB Colouring

RGB Colour Model

An additive colour model used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours. RGB commonly uses an 8 bit per channel of colour system.

2⁸ possible shades of blue =256 blue colours



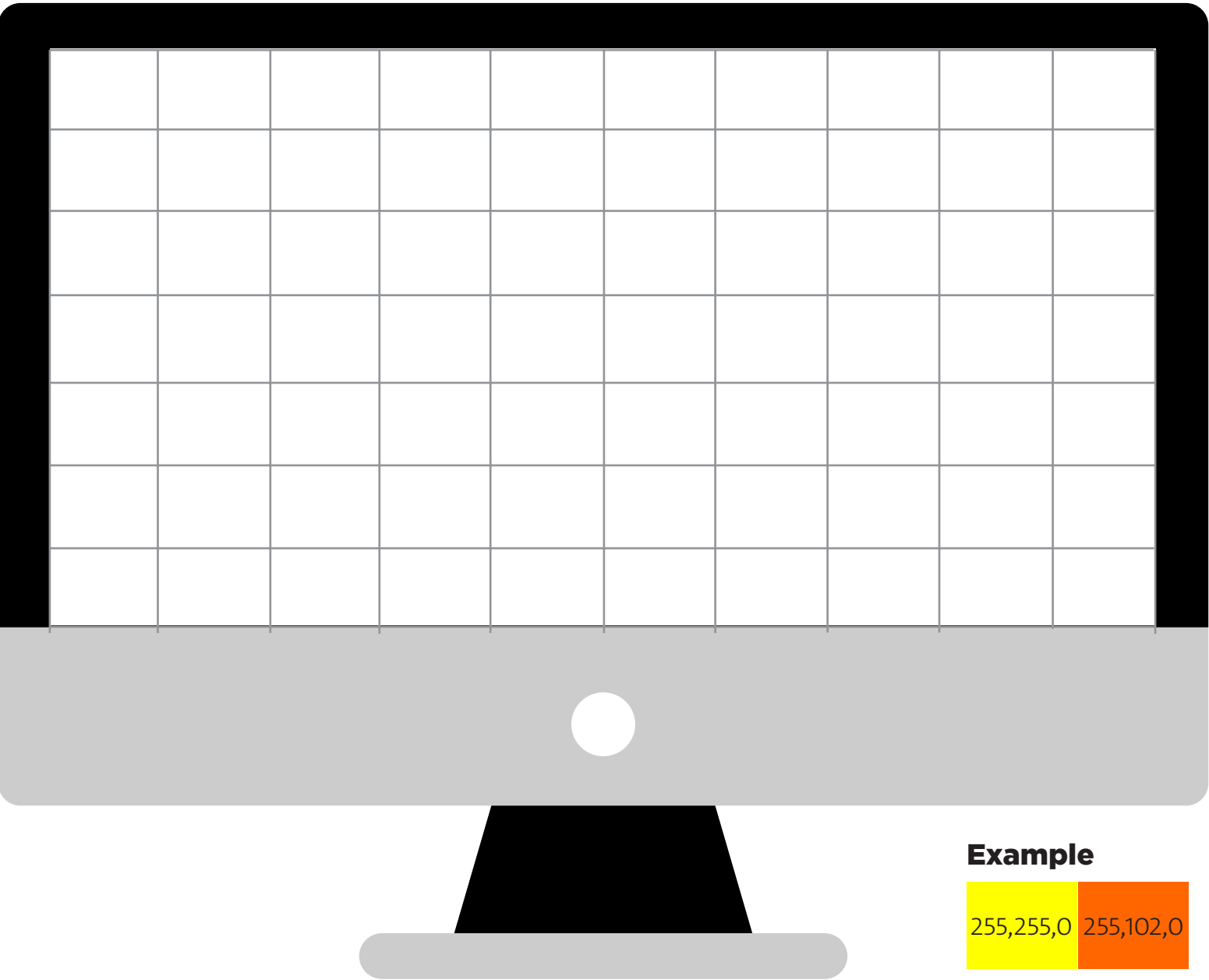
2⁸ possible shades of green =256 green colours

2⁸ possible shades of red =256 red colours

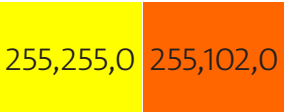
256 x 256 x 256 = 16.8 million different possible colours

RGB Colouring

On the screen to the right, create an image to colour by RGB for your partner. Using the table below, place an RGB value in the squares you would like your partner to colour in.



Example



	RGB(0,0,0)
	RGB(255,255,255)
	RGB(255,0,0)
	RGB(0,255,0)
	RGB(0,0,255)
	RGB(255,255,0)
	RGB(255,0,255)
	RGB(0,255,255)
	RGB(153,153,255)
	RGB(153,51,102)
	RGB(255,255,204)
	RGB(204,255,255)
	RGB(102,0,102)
	RGB(255,128,128)
	RGB(0,102,204)
	RGB(204,204,255)
	RGB(0,0,128)
	RGB(0,0,255)
	RGB(0,204,255)
	RGB(204,255,255)
	RGB(204,255,204)
	RGB(255,255,153)
	RGB(153,204,255)
	RGB(255,153,204)
	RGB(204,153,255)
	RGB(255,204,153)
	RGB(51,102,255)
	RGB(51,204,204)
	RGB(153,204,0)
	RGB(255,204,0)
	RGB(255,153,0)
	RGB(255,102,0)

Images: RGB Cube [Image] (n.d.). Retrieved from https://commons.wikimedia.org/wiki/File:RGB_Colorcube_Corner_White.png [Image] (n.d.). Retrieved from <https://excelatfinance.com/xlf/xlf-colors-1.php> Vectors from www.freepik.com



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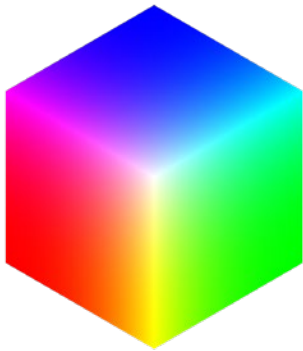
Activity 1: RGB Images

RGB Colour Model

An additive colour model used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours.

RGB commonly uses an 8 bit per channel of colour system.

2⁸ possible shades of blue =256 blue colours



2⁸ possible shades of green =256 green colours

2⁸ possible shades of red =256 red colours

256 x 256 x 256 = 16.8 million different possible colours

Instead of using either the RGB or Hex code, we have given you a key to use! The corresponding colours, their key and official codes are below. Use the code to colour the picture and reveal the mystery image.

Colour	Key	Hex	RGB
Black	1	#000000	0, 0, 0
Red	2	#FF0000	255, 0, 0
Yellow	3	#FFFF00	255, 255, 0
Grey	4	#808080	128, 128, 128
Orange	5	#FFA500	255, 165, 0
Brown	6	#8B4513	139, 69, 19
Dark blue	7	#0000FF	0, 0, 255
Sky Blue	8	#00BFFF	0, 191, 255
Green	9	#008000	0, 128, 0
Purple	10	#8A2BE2	138, 43, 226

8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	3	3	3
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	8	3	3
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	3	3	3
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	8	8	3
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	8
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
8	8	9	9	9	8	9	9	8	8	8	9	9	9	8	9	9	9	8	8
8	8	8	8	9	9	9	8	8	8	8	8	8	9	9	9	8	9	8	8
8	8	9	9	9	6	9	9	8	8	8	8	9	9	6	9	8	8	8	8
8	8	9	9	8	6	8	9	9	8	8	8	9	8	6	9	9	8	8	8
8	8	9	9	8	6	8	8	8	8	8	8	8	8	6	8	8	8	10	1
8	8	8	8	8	6	8	8	8	8	8	8	8	8	6	8	8	10	10	1
8	8	8	8	8	6	8	8	8	8	8	8	8	8	6	8	10	10	10	1
8	8	8	8	8	6	2	8	8	8	8	8	8	2	6	8	8	8	8	1
8	8	8	8	8	6	8	2	8	8	8	8	2	8	6	8	8	8	8	1
8	8	8	8	8	6	8	2	2	2	2	2	2	2	8	6	8	1	1	1
8	8	8	8	8	6	8	8	8	8	8	8	8	8	6	8	8	1	1	1
7	7	7	7	7	3	3	3	3	3	3	3	3	3	3	7	7	7	7	7
7	7	7	7	3	3	3	3	3	3	3	3	3	3	3	3	7	7	7	7
7	7	7	3	3	3	3	3	3	3	3	3	3	3	3	3	3	7	7	7

Images: RGB Cube [Image] (n.d.). Retrieved from https://commons.wikimedia.org/wiki/File:RGB_Colorcube_Corner_White.png Images: Vectors from www.freepik.com



Activity 2: RGB Images

An additive colour model used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours.

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256 x 256 x 256 = 16.8 million different possible colours

Colour	Key	Hex	RGB
Black	1	#000000	0, 0, 0
Red	2	#FF0000	255, 0, 0
Yellow	3	#FFFF00	255, 255, 0
Grey	4	#808080	128, 128, 128
Orange	5	#FFA500	255, 165, 0
Brown	6	#8B4513	139, 69, 19
Dark blue	7	#0000FF	0, 0, 255
Sky Blue	8	#00BFFF	0, 191, 255
Green	9	#008000	0, 128, 0
Purple	10	#8A2BE2	138, 43, 226

Activity 4: RGB Images

An additive colour model used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours.

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Colour	Key	Hex	RGB
Black	1	#000000	0, 0, 0
Red	2	#FF0000	255, 0, 0
Yellow	3	#FFFF00	255, 255, 0
Grey	4	#808080	128, 128, 128
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Brown	6	#8B4513	139, 69, 19
Dark blue	7	#0000FF	0, 0, 255
Sky Blue	8	#00BFFF	0, 191, 255
Green	9	#008000	0, 128, 0
Purple	10	#8A2BE2	138, 43, 226

[illegible]

Activity 5: RGB Images

An additive colour model used in computer screens and displays. By adding different combinations of red, green and blue light together in each pixel we can create a large range of colours.

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Grey	4	#808080	128, 128, 128
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Brown	6	#8B4513	139, 69, 19
Dark blue	7	#0000FF	0, 0, 255
Sky Blue	8	#00BFFF	0, 191, 255
Green	9	#008000	0, 128, 0
Purple	10	#8A2BE2	138, 43, 226

														6		6				
														6	6	6	6			
														6	6	0	0	6	6	
	6													6	0	1	0	0	6	6
6	0	6												6	0	0	0	0	6	6
6	0	6												6	0	0	0	6	6	
6	0	6												8	10	0	6			
6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	8	8	6			
6	6	6	6	6	6	6	6	6	6	6	6	6	6	8	10	6				
	6	6	0	0	0	0	0	0	0	0	0	0	0	0	8	10	10	8		
		6	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8			
		6	0	0	0	0	0	0	0	0	0	0	0	0	0	6				
		6	0	0	0	0	0	0	0	0	0	0	0	0	6	6				
		6	0	6	6	6	6	6	6	6	6	6	0	6						
		6	0	6	0	6			6	0	6	0	6							
		6	0	6	0	6			6	0	6	0	6							
		6	0	6	0	6			6	0	6	0	6							
		6	0	6	0	6			6	0	6	0	6							
			6		6					6		6								

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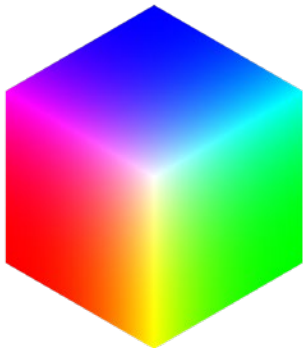
Activity 6: RGB Images

RGB Colour Model

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Grey	4	#808080	128, 128, 128
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Brown	6	#8B4513	139, 69, 19
Dark blue	7	#0000FF	0, 0, 255
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Green	9	#008000	0, 128, 0
Purple	10	#8A2BE2	138, 43, 226

8	8	8	8	8	8	8	8	8	8	8	8	8	6	8	6	8	8	8	8
8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	8	8	8
8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	0	0	6	6	8
8	6	8	8	8	8	8	8	8	8	8	8	8	6	0	1	0	0	6	6
6	0	6	8	8	8	8	8	8	8	8	8	8	6	0	0	0	0	6	6
6	0	6	8	8	8	8	8	8	8	8	8	8	6	0	0	0	6	6	8
6	0	6	8	8	8	8	8	8	8	8	8	8	7	10	0	6	8	8	8
6	6	6	6	6	6	6	6	6	6	6	6	6	10	7	7	6	8	8	8
6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	10	6	8	8	8
8	6	6	0	0	0	0	0	0	0	0	0	0	0	7	10	10	7	8	8
8	8	6	0	0	0	0	0	0	0	0	0	0	0	0	6	7	8	8	8
8	8	6	0	0	0	0	0	0	0	0	0	0	0	0	6	8	8	8	8
8	8	6	0	0	0	0	0	0	0	0	0	0	0	6	6	8	8	8	8
9	9	6	0	6	6	6	6	6	6	6	6	6	0	6	9	8	9	8	9
8	9	6	0	6	0	6	9	8	6	0	6	0	6	9	8	9	8	9	8
9	9	6	0	6	0	6	9	9	6	0	6	0	6	9	9	9	9	9	9
9	8	6	0	6	0	6	9	8	6	0	6	0	6	8	9	8	9	8	9
9	9	6	0	6	0	6	9	9	6	0	6	0	6	9	9	9	9	9	9
9	9	6	0	6	0	6	9	9	6	0	6	0	6	9	9	9	9	9	9
9	9	9	6	9	6	9	9	9	9	6	9	6	9	9	9	9	9	9	9

Images: RGB Cube [Image] (n.d.). Retrieved from https://commons.wikimedia.org/wiki/File:RGB_Colorcube_Corner_White.png Images: Vectors from www.freepik.com