My NASA Data - Interactive Models

Creating Images from Numbers

Grade Band

- 6-8

Time

- 15 minutes

Directions

Materials

- Colored pencils or crayons: White, Orange, Red, Yellow, Green, Blue, Black or self selected colors
- Handouts

Steps

1. Use the COLOR KEY provided or complete the blank table to create your own COLOR KEY.
2. If you create your own, select each color to represent numbers in the ranges with no color identified. ?
3. Use the DATA table provided to color the cells on your GRID with the colors in your COLOR KEY. (You may use the interactive slides to drag and drop the colors.)
4. Check with your instructor on how to submit answers.

COLOR KEY	
Number Range	Color
0-5	Black
6-10	Blue
11-15	Green
16-20	Yellow
21-25	Red
26-30	Orange
31-35	White

COLOR KEY	
Number Range	Color
0-5	Black
6-10	
11-15	
16-20	
21-25	
26-30	
31-35	White

TC Matrix Size		TC Matrix Size	
Latency (cy)	Throughput (GFLOPS/SM)	Latency (cy)	Throughput (GFLOPS/SM)
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32

Summarize

The image you created is called a **false-color image** because the image is made from colors assigned to numbers and not a photograph. The numbers are data that could come from many different sources. *The concept of creating an image from data is the same regardless of where the data come from. The data could be wind speed, elevation or other variables.*

You can see false color images in the video NASA Sees 30 Years of Yellowstone Recovery from 1988 Fires. The burn scars are not red in visible images.

NASA Sees 30 Years of Yellowstone Recovery from 1988 Fires

NASA Sees 30 Years of Yellowstone Recovery from 1988 Fires | https://www.youtube.com/watch?v=UG_S7I2-Ct4 | Source: NASA's Goddard Space Flight Center/Matthew Radcliff

Questions

Answer the questions below.

1. Answer the following questions if the data are **wind speed** in km per hour.
    1. What color is the fastest? Slowest?
    2. Where is the wind between 21-25 km per hour?
2. Answer the following questions if the data are **elevation** in meters above sea level.
    1. What color is the lowest? Highest?
    2. Where is the elevation between 31 and 35 meters above sea level?
3. Do you notice any pattern in the image?
4. How does the size of the grids in the grid paper affect the image that you created?
5. Which do you think would be more realistic, larger grid sizes or smaller? Why?

Sources:

1. Dunbar, Brian. “Remote Sensing Math Educator Guide.” *NASA*, NASA, Retrieved on May 30, 2013, from https://www.nasa.gov/stem-ed-resources/remote-sensing-math.html.
2. Video: NASA's Scientific Visualization Studio
   Images courtesy of Jim Peaco, National Park Service and the United States Geological Survey and NASA's Earth Observatory

Teacher Note

Teachers who are interested in receiving the answer key, please complete the Teacher Key Request and Verification Form. We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

Document Resources

- Creating Images from Numbers Student Sheets

Google Slide interactive Files

Google Slide - Creating Images from Numbers