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|  |  | **Worksheet - Video Guide for “A Little Bit about Pixels”** | logo.png |

# VIDEO OVERVIEW

In this video, Kevin Systrom, one of the co-founders of Instagram (a popular image sharing application), and Piper Hanson, a freelance photographer, explain pixels, RGB color, how image filters work, and that all image data is ultimately represented as bits, 1’s and 0’s.

# Concepts

* Image sharing
* Digital images as data
* RGB color
* Screen resolution and pixel density
* Digital photo filters

# THINK/DISCUSS

* Do pixels have to be physically represented as squares? What else could they be and why? Why are squares preferred?
* Think about your favorite image filters. How do you think the RGB values are manipulated to produce another image? Suggest possible algorithms.
* How do you suppose image sharing services could send the image data (bits) faster from one machine to another?
* Why can you never have a perfect digital reconstruction of a real-life image no matter how many pixels are used?
* There are 8 bits in one byte. How many bits and how many bytes are used to represent one pixel’s RGB components?

# QUESTIONS

1. Why were images first broken down into pixels? What problem did this solve?

They were broken down into pixels so the computer could read them as the problem they were trying to solve was digitizing photos.

1. How many different values can be represented by one Red component of a pixel?

255 different values

1. What are screen resolution and pixel density? How do they differ? Draw a diagram to support your answer.

Screen resolution is the number of distinct pixels in each dimension that can be displayed. Pixel density is pixels per inch and pixels per centimeter represent how many pixels are shoved onto a screen. They differ because the screen resolution is the total number of pixels and pixel density is how many pixels can fit in an inch or centimeter on the given screen.



1. RGB Values
   1. Why do RGB values range from 0 to 255?

That is the maximum possibilities with an 8 bit.

* 1. Can they be any other range?

No

* 1. What happens if you increase the range?

If you could the colors would change.

* 1. Is it possible to represent all of the colors in the world? Why or why not?

No because of the limited number in a bit.

1. Describe a function that would take in any RGB value and double its intensity. What do you think happens if the input is 200, 220, 209?

If you did x times x, x being the RGB value. I think those values would max out at 255 and would end up being black.

1. Extra: Take out the calculator! How many different colors can be represented in the standard RGB color model?
   1. 16,581,375 colors