$\qquad$ Period $\qquad$ Date $\qquad$

## Worksheet - Video Guide for "A Little Bit about Pixels"



## 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?
2. How many different values can be represented by one Red component of a pixel?
3. What are screen resolution and pixel density? How do they differ? Draw a diagram to support your answer.
4. RGB Values
a. Why do RGB values range from 0 to 255 ?
b. Can they be any other range?
c. What happens if you increase the range?
d. Is it possible to represent all of the colors in the world? Why or why not?
5. Describe a function that would take in any RGB value and double its intensity. What do you think happens if the input is $200,220,209 ?$
6. Extra: Take out the calculator! How many different colors can be represented in the standard RGB color model?
