



Creating colorful collaborations, one sticker at a time.

# All About Pixels

## Lesson Plan



**This lesson is flexibly designed to promote and develop the following skills:**



### Collaboration

Students will work with a partner to complete the given activity.



### Technology

Students will come to better understand how digital images are created by using pixels of color.



### Coding

Depending on how deep the teacher chooses to go with the lesson, an introduction to “conditional formatting” can be explored.

Ultimately, this lesson is aimed to have students understand the digital concept of “pixels” while making a connection to the fun, creativity, and collaborative nature of StickTogether® products!

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#### Total lesson time:

Approx. 45 - 60 min.

#### Suitable for ages:

elementary / middle school

#### Lesson materials:

- Stick Together poster (or [StickTogether website](#))
- Display screen
- Student devices (laptops / desktops)

#### Lesson components overview / hyperlinks:

**Introduction:** (5 to 10 min.)

Orientation to / example of “pixels”

**Lesson Instructions:** (10 to 15 min.)

Establish an understanding of the linked spreadsheet

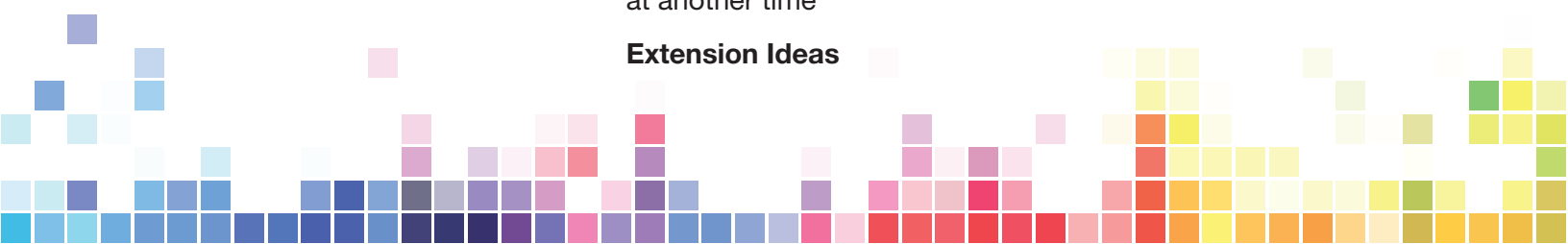
**Pixelation Creations + Collaboration Time:** (30 to 45 min.)

Students work in partners to create digital, mini-versions of StickTogether poster

**Closure:** (5 min.)

Wrap up & review and/or decide how to continue the project at another time

#### Extension Ideas



## Introduction:

(5 to 10 min.)

Zoom in on a high resolution image to establish an understanding that individual pixels are used to make digital images.



**Opening Question:** “When you draw using paper and crayons, (or markers, or pencil, etc.) how do you make a picture / drawing? When you look at an image on a screen (a tablet, computer display, smartphone, etc.) is it made the same way? Let’s take a look at a digital image together more carefully.”



**A**

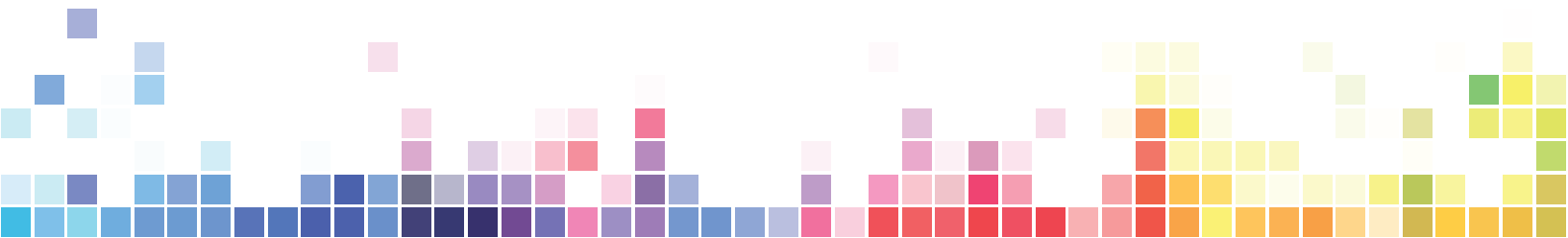
**Option A:** Use an image from your own collection. Progressively zoom in on the image step by step until the pixels that are used to make the image becomes evident. (i.e. - on a Mac, download the image to your desktop and open the file with “Preview” and click on the plus button.)

**B**

**Option B:** Use this [slideshow of images](#), which progressively zooms in on a scene of rafters on a river. The final slide will make it evident that the entire photo is actually made from individual squares of color.

*Whether using Option A or B above, you may find it more intriguing to begin with the fully zoomed in image (where pixels are evident) then pull away to reveal what the “normal size” image is.*

Depending on your level of experience with StickTogether products, this is an excellent time to make connections between the concept of StickTogether posters and the pixels that comprise digital images. StickTogether posters use thousands of individual squares of color (stickers) to create a wide variety of images. ([See full gallery of products here.](#)) ...If you’ve not yet created your own or started the process, [this link documents one school’s journey](#) of completing a StickTogether poster, making the “pixelation” concept come into full view!



## Lesson Instructions:

(10 to 15 min.)

Orient students to the [“Pixelation Creations + Collaboration” spreadsheet](#).

Note that it is currently “View only.” So “Make a copy” and decide how you will [share](#) it with your students (i.e. Google Classroom).

Depending on your students’ familiarity with Google products and/or spreadsheets, it may be valuable to spend a short moment walking through the features of a blank spreadsheet.

Spreadsheets are used for a wide variety of applications - from basic list making, to a full range of calculating functions, to business / analytic scenarios, and much more.

Tab by tab, (with special emphasis on the first one) introduce your students to the [linked spreadsheet](#). (Same as link above.)



**Teacher prep note:** Click to the spreadsheet now if you haven’t already done so yet!



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### Key points of understanding for the spreadsheet activity:

*Read through the directions tab together so there is a common understanding of...*

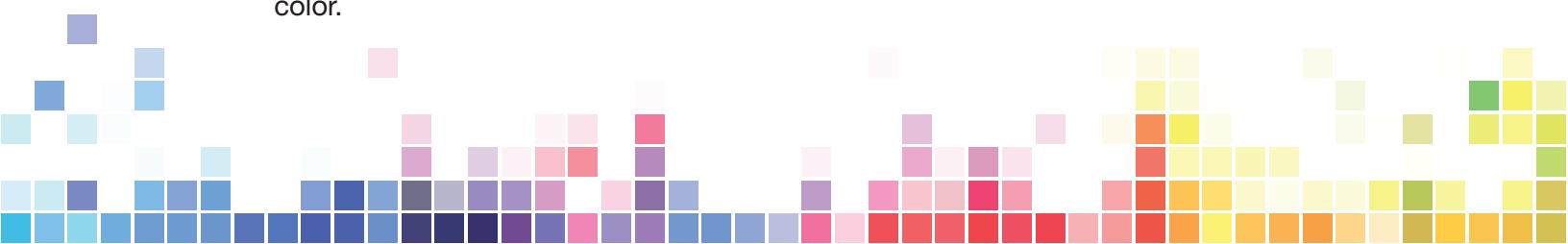
- how cells are filled in via typing various letters from the corresponding key at the top of each tab
- the procedure / flow for completing various pixel images and moving on to the next
- how to complete a pixel image individually, and collaboratively (consider using another device to demonstrate this)
- the link between this activity and StickTogether products!

*Note that the images to be recreated (the turtle, the heart, etc.) are inserted images, not individual pixels. This was done intentionally so that students are prevented from simply “copying and pasting” rows / columns of cells to complete the image.*

*Although a spreadsheet uses upper case letters to define columns, typing lowercase letters is all that is necessary for the conditional formatting rule to work.*



At your discretion, this is the point in the lesson where you can dive deeper into “conditional formatting.” (This is a connection to coding. See this [Google support page](#) for more details.) Students can access the conditional formatting rules to either change / add to the color palette options or “hack” which input keys fill in cells with a given color.



## Pixelation Creations + Collaboration Time:

(30 to 45 min.)

With the directions for the activity established,  
it's time to launch into the activity!

### Procedure:

- 1** Students begin spreadsheet on their own. Once the “turtle” has been completed and shown to you (the teacher) it's time to pair each student up with another partner who has also completed it in order to continue working on other images together.
- 2** Paired students decide which one will “Share” the spreadsheet with the other, so that the two can be collaboratively working together to complete the next, agreed upon image.
- 3** As the last line of the first tab instructs: Create, collaborate, celebrate, repeat!

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### Closure:

(5 min.)

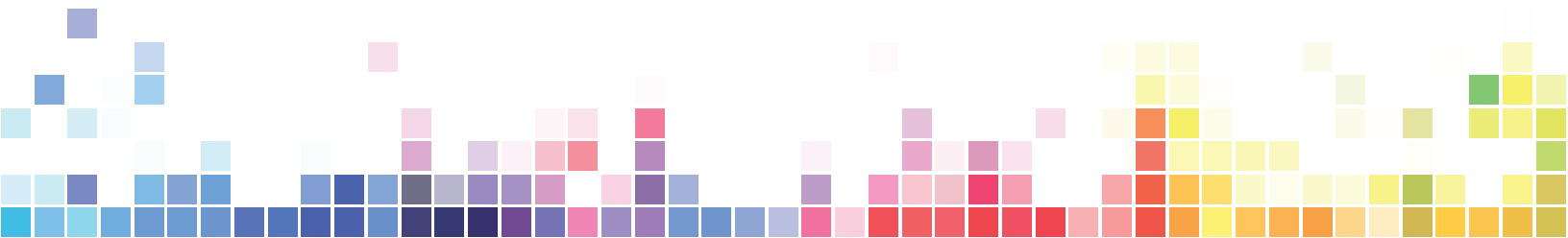
Consider the following options and questions  
when bringing the lesson to a close.

- Steer the students back to the image you zoomed in on at the lesson's beginning (and/or the StickTogether poster you have) to make closure connections.
- Ask, “How will this lesson on pixels have you thinking differently about digital images that you see? ...What other images might you see today that are made from pixels?”
- Ask, “How did collaborating with your partner make this activity better? ...What did you do with your partner that helped make your pixelation creations successful?”
- Ask, “If you could change one thing about our lesson time today, what would it be?”

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*Regardless of which questions you do / don't ask, provide clarity on the next steps:*

- Will you be giving students more time to complete Pixelation Creation + Collaboration images? (Note: This lesson was not designed to have students complete them all, of course. The number of image options were given in the interest of student choice!)
- What are your expectations for how many / what levels of images are to be completed?
- How are you transitioning from this activity to your next StickTogether poster creation time?



## Extension Ideas:



### Reading

Explore your school's library collection for books on coding, programming, digital design, or other related topics.

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### Writing

Consider a procedural writing piece: "How to create a StickTogether poster" or "How to create pictures with pixels using a spreadsheet" Or bring the story of one - or more - of the images to life with a creative, narrative piece. (i.e. "A Bird's Journey" or "Mr. Dolphin's Pizza Shop")

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### Math

Do some calculation / research on how many pixels were used for the various spreadsheet images or find out how many stickers are used in a StickTogether poster?

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### Technology

Is it possible to make the watermelon (or any other image on one of the tabs) alternate colors? How?

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### Engineering / Math / Writing

Imagine this activity was done with only paper and markers. Pretend you gave a friend the coloring materials along with grid paper - and you had a copy of the final picture. What instructions / directions would your partner need in order to draw the picture you have? (Assuming you can't show your partner the picture, but only give them written / verbal directions.)

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For comments or questions about this lesson please email  
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