

# Unplugged K - 8 Computer Science Enrichment Activities

Week 7 | *Pixels* | [K-2 Link to files](#) [3-8 Link to files](#)

**Big Idea:** Computer screens are divided into a grid pattern. Every cell on the grid is called a pixel (short for “pixel element”). In modern computers, pixels are so tiny your eyes can’t see them individually, but every pixel can change color when the computer tells it to. Images are displayed on your screen when your computer tells a specific group of pixels to turn certain colors. This means that the colors in images on your screen are arranged on a coordinate plane, or graph. The computational thinking concepts in this activity include identifying patterns, decomposing the image into pixels, and abstraction as we build our image using different schema to color the pixels. In this activity students will identify squares on a grid as either black or white squares to recreate an image using numbers. Have fun!

**Instructions:** Read the directions for your grade level. It explains how many minutes per day you should complete Computer Science work for your grade level, along with the suggested computer websites on Ms. Sisney’s class website. Click the **link to the files** above for your assignments. Make a copy of the files in order to type, write, or draw on the documents.

<p><b>K - 2</b> <b>Time:</b> 30 - 45 minutes</p> <ul style="list-style-type: none"><li>• <b>MWF</b>   10 minutes per day</li><li>• <b>T/Th</b>   15 minutes per day</li><li>• <b>1-day</b>   30 minute block</li></ul> <p><b>Modifications:</b> You can create larger grids for students that have difficulty with hand-eye coordination.</p>	<p><b>Standards:</b> <b>CSTA</b> 1A-AP-09   Model the way programs store and manipulate data by using numbers or other symbols to represent information.</p> <p><b>Common Core Mathematics</b> K   <i>Goal 4</i>   Craft and Structure. 1 - 2   <i>Practices: 4</i> - Model with</p>
<p><b>3 - 5</b> <b>Time:</b> 60 - 75 minutes</p> <ul style="list-style-type: none"><li>• <b>MWF</b>   20 minutes per day</li><li>• <b>T/Th</b>   30 minutes per day</li><li>• <b>1-day</b>   60 minute block</li></ul>	<p><b>Standards:</b> <b>CSTA</b> 1B-AP-09   Create programs that use variables to store and modify data.</p> <p><b>Common Core Mathematics</b></p>

<p><b>Modifications:</b> Differentiate by changing the size of the grid or see K - 2 and have students create images by writing 0s and 1s on grid. (Note: Hidden image on worksheet is Saturn)</p>	<p><i>Practices</i>   4 - Model with Mathematics, 7 - Look for and make use of structure.</p>
<p><b>6 - 8</b>  <b>Time:</b> 90 minutes</p> <ul style="list-style-type: none"> <li>● <b>MWF</b>   30 minutes per day.</li> <li>● <b>T/Th</b>   45 minutes per day.</li> <li>● <b>1-day</b>   90 minute block</li> </ul> <p><b>Modifications:</b> Differentiate by changing the size of the grid. Older students can create grayscale images or color images. Have them create their own unique code for identifying the color of the pixels. (Note: Hidden image on worksheet is Saturn)</p>	<p><b>Standards:</b>  <b>CSTA</b>  2-DA-07  Represent data using multiple encoding schemes.  <b>Common Core Mathematics</b>  <i>Practices</i>   4 - Model with Mathematics, 7 - Look for and make use of structure.</p>