

Website: [CS+Data Week 1 Lesson 3](#)

Unit of Inquiry Name: CS+Data	Week 1 Lesson # 3
Time: 45 - 60 Minutes	
Lesson Core Idea: When a picture gets smaller, it loses details. Lesson Objectives: Use pixels to draw the smallest possible butterfly and decide which details to give up.	
Computer Science Standards <p>3-5.AP.12 Create programs that include events, loops, and conditionals.</p> <p>3-5.AP.14 Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features.</p> <p>3-5.AP.17 Test and debug a program or algorithm to ensure it accomplishes the intended task.</p> <p>3-5.DA.7 Explain that the amount of space required to store data differs based on the type of data and/or level of detail.</p>	
Other Standards <p>CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.</p>	
Integrated ELD Language Target: <i>In progress</i>	
Key vocabulary: pixel, data, storage	
Scratch blocks focus: change pixelate effect by (a number)	

Materials Needed	Prepare
<ul style="list-style-type: none"> • Calendar Week 1: Scroll Down to preview the: <ul style="list-style-type: none"> ○ Week 1: Overview video ○ Week 2: Anchor chart video • Website: CS+Data Week 1 Lesson 3 	<ul style="list-style-type: none"> • Preview the Week 1 Overview Video. • Preview the Week 1 Anchor Chart Video. • Walk through the CS+Data Week 1 Lesson 3. • Add Scratch Starter Project for students to access and open from Google Classroom (or LMS used):

<ul style="list-style-type: none"> • Scratch Starter Project: <ul style="list-style-type: none"> ○ https://scratch.mit.edu/projects/505663861/ • Observe Slides: <ul style="list-style-type: none"> ○ Week 1 Lesson 3: CS+Me Slide • EXTRAS: Scratch Video: Pixel Art in Scratch Three Ways Tutorial • Student Chromebooks, laptops, or tablets with reliable wifi • Teacher computer with projector or screen sharing • Suggestion: have students use earbuds/headphones to listen to sounds 	<ul style="list-style-type: none"> ○ https://scratch.mit.edu/projects/505663861/ • Make sure you preview the: <ul style="list-style-type: none"> ○ Observe Slides: Week 1 Lesson 3: CS+Me Slide so you know how to guide students' observations. • FOR THIS LESSON: Teachers are encouraged to REMIX and create their own Week 1 Lesson 3: Pixels Scratch project for their own Scratch Teacher accounts. • EXTRAS: When students are done, have students watch Pixel Art in Scratch Three Ways Tutorial and follow the instructions to create a new Scratch project.
<p>To Post on Google Classroom: WEEK 1 LESSON 3</p>	
<p>Teachers: Go to today's website CS+Data Week 1 Lesson 3 and follow instructions.</p>	
<p>What to link to this Google Classroom Assignment Scratch Project - Week 1 Lesson 3: Pixels</p>	

Stage	Teacher Does Strategies/activities	Student Does Learning Experience...
1 UCSD Does 5 minutes	<p>Hello programmers! Last time, we drew a weather logo with code; today, we're going to draw using pixels!!</p> <p>First, a programmer from UC San Diego is going to introduce our programming challenge. We're doing TIPP and SEE together! Then, as we play the project, observe what happens when you follow the instructions.</p>	<p>Students watch video: Week 1 Lesson 3: Pixels on Scratch.</p>

	Play video - Week 1 Lesson 3: Pixels on Scratch.	
2 We Do 10 - 15 minutes	<p>Okay programmers; now that we watched the video, let's get started with TIPP&SEE! Let's open the Week 1 Lesson 3 Scratch project.</p> <p>Open the Scratch Starter Project - Week 1 Lesson 3: Pixels and project on Screen (if you can).</p> <p>Let's go through TIPP together!</p> <p>Who can tell us what the title of the project is?</p> <p>What are the instructions?</p> <p>What is the purpose?</p> <p>How do we play it?</p> <p>Let us play and observe what happens when we follow the instructions (that students just read).</p> <p>Great work, programmers! Now that we've figured out the Title, Instructions, Purpose, and Play of the Scratch project, let's do SEE!</p> <p>SEE stands for Sprites, Events, Explore! This tells us how to look at a program and figure out what it does. Let's use SEE to look at our Scratch program. We start by clicking "See Inside" at the top right corner.</p> <p>Open the Scratch Starter Project - Week 1 Lesson 3: Pixels Click on "See Inside". Then, model the video by looking at each Sprite, seeing what events it has, and exploring the code.</p> <p>What do we notice about the Sprite(s)? What events do we see in the code? What do you want to explore?</p> <p>Great work programmers; next, please help me fill this slide out as the UCSD programmer explained it to us. Please raise your hand and let me know what I should do on the slide to complete it.</p> <p>Open the TIPP+ SEE Observe Slides - Week 1 Lesson 3: CS+Me</p>	<p>Students answer questions and direct the class to the title, instructions, purpose and how to press play for the Scratch program to run.</p> <p>Press the Green flag to play the program and have students observe what happens within the program.</p> <p>Students describe what they notice about the Sprite, the events they can find in the code and what they want to explore in the code.</p>

	<p>Slide</p> <p>Read the Observe Slides and ask students to navigate as you move the mouse, click and type what students direct. (Teacher drives/students navigate - <i>teacher as lead learner</i>)</p> <p>Use the video from Part 1 UCSD DOES if you and/or the students forget how to fill out this information.</p> <p><i>Great work, programmers! Thank you for helping us complete the Observation slides to help us plan for completing this project!</i></p>	<p>Students navigate as the teacher drives the mouse and keyboard to complete the Week 1 Lesson 2: Slide as explained in the TIPP&SEE video:</p>
<p>3 YOU DO 25 - 30 minutes</p>	<p><i>Great work, programmers! I heard a lot of creative and funny ideas! Now, we're ready to explore and take on the programming challenge for today!</i></p> <p><i>You'll find a link to the Scratch project on Google Classroom; here is the programming challenge:</i></p> <ol style="list-style-type: none"> <i>1. How many times do you have to click for different features to disappear?</i> <i>2. What's the smallest butterfly you can draw?</i> <i>3. How many pixels does it use?</i> <i>4. What details does it have? What details are missing?</i> <p><i>Remember, we can always challenge ourselves to explore and try new things as programmers! Let's get in there, have fun and find some cool problems to solve!</i></p> <p>If students think they have completed their program, check and make sure that the students were able to complete the programming challenges as described by this section of the website.</p> <p>Once students are done, ask them to view the Extras section.</p> <div data-bbox="350 1396 1275 1475" style="background-color: #e0c0e0; padding: 10px; text-align: center;"> <p>Facilitator Questions</p> </div>	<p>Students go to Google Classroom to open the link to the Scratch Starter Project and read the directions for their programming challenge.</p> <p>Students work individually on the programming challenge and ask for help or to share their screen if they have a question or a cool problem to share.</p>

	<ul style="list-style-type: none"> Who's got a cool problem to share? (Growth mindset, facilitates students learning from each other) _____, show us how far you have gotten. (Focus on the journey and learning, not "finishing".) I don't know; let us learn together! (Be a Lead Learner) We can always do more! Let's look at the purple "Do More" section for some ideas! (Differentiation) <p><i>Wow, amazing work today, programmers! I love the way you shared cool problems and worked together to solve them!</i></p> <p><i>Before we end today or when you are done, do not forget to download your Scratch project onto your Chromebook. You can work on it at home by uploading it onto the Scratch website or Scratch app. Once you are done at home, do not forget to download it again.</i></p> <p>Have students save their projects on their Chromebooks.</p>	<p>Students share cool problems with the class (ideally projecting their screens) and other students help with problem solving.</p> <p>Students drive while other students (and the teacher, if necessary) help them navigate through their questions and challenges.</p> <p>Students save their projects.</p>
<p>6 Programmers Say 5 - 10 minutes</p>	<p><i>That project was so cool! Let's talk about what we noticed. We will work in pairs; one partner will be programmer A; the other partner will be programmer B.</i></p> <p>Group students in pairs; use any method to decide which student is programmer A and which one is programmer B.</p> <p><i>Okay programmers, raise your hand if you are programmer A!</i></p> <p>Wait for students to raise their hands.</p> <p><i>Great! Programmers A, put down your hands. Programmers B, raise your hand!</i></p> <p>Wait for students to raise their hands.</p>	<p>Students raise their hand if they are programmer A.</p> <p>Students raise their hand if they are programmer B.</p>

	<p>Great! Programmers B, put down your hands. Now, programmer A, turn to your partner programmer B and tell them: When I click ____ times, I can't see the butterfly's ____.</p> <p>Programmer B, turn to programmer A and please tell them: I drew a butterfly that has all it's details in only ____ pixels.</p> <p>Students turn and talk using the sentence frames in this section. Give them 1 - 2 minutes to do this.</p>	<p>Students turn and talk with a partner using the sentence frame.</p> <p>Students turn and talk with a partner using the sentence frame.</p> <p>Students share out.</p>
EXTRAS	<p>Okay programmers, if you feel that you have complete your Scratch programming challenge, view the EXTRAS Scratch video and see if you can create the same Scratch project!</p> <p>When students are done, have students watch Pixel Art in Scratch Three Ways Tutorial and follow the instructions to create a new Scratch project.</p>	<p>Students watch Pixel Art in Scratch Three Ways Tutorial and follow the instructions to create a new Scratch project.</p>