**Lesson created by the GMU-ODU CSforAll Team. For more information about**

**this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at achutchison1@ua.edu**

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| **Unit 3 Lesson 3 Algorithms & Debugging**  *3rd & 4th Grade* | | |
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| **Concept: Algorithms & Debugging** | | |
| **Vocabulary:**  • Algorithms  • Explanatory Writing  • Control Blocks and Loops | | |
| **Narrative/Summary:**  In this lesson, students will finish planning and then animating their explanatory writing in Scratch and check for consistency. | | |
| **Lesson Objectives (learning targets): I can…**   * Review Scratch blocks and Loops * Animate, and self-monitor my writing in Scratch using Coco Level 3 (Column 1, 2, 3, 4) * Review writing and animation for a match * Share my animation and writing with peers | | |
| **VDOE ELA Standard(s)** | **VDOE Computer Science Standard(s)** | |
| The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.  a) Engage in writing as a process.  b) Identify audience and purpose.  c) Use a variety of prewriting strategies.  d) Use organizational strategies to structure  writing according to type.  g) Use transition words to vary sentence  structure. | The student will construct programs to accomplish tasks as a means of creative expression using a block or text-based programming language, both independently and collaboratively  a. using sequencing;  b. using loops (a wide variety of patterns such as repeating patterns or growing patterns); and  c. identifying events.  The student will create a plan as part of the iterative design process, independently and/or collaboratively, using a variety of strategies (e.g., pair programming, storyboard, flowchart, pseudocode, story map). | |

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| **Materials** |
| **Lesson materials:**   * Chromebook/Laptop * Internet Access * [Link to Scratch](https://scratch.mit.edu/) * [Link to Coco](https://wego.gmu.edu/scratchgo/login.php) * Teacher slide deck * CoCo column one filled in (from last time)   **Supplemental resources:** |

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| **Lesson Structure and Activities** |
| **Note for Teachers:**   * **Prior to beginning this Unit,** be sure to assign your students a story in CoCo, using **Level 3.** * **Please use the following naming strategy for assigning the story in CoCo:**   + “Unit # + Descriptor”, for example, “Unit 3 Story.” * **Students should use the same naming strategy for their final Scratch Project:**    + “Student Name + Unit # + Descriptor”, for example, “Johnny Unit 3 Story” |
| **Warm-up/Introduction:**  **NOTE: All slides for this lesson are scripted so that, if needed, you can see exact definitions and instructions for teaching this lesson in the notes at the bottom of the teacher slide deck.**   * (Optional) Read aloud the summary and standards, the materials and resources needed for this lesson, and the lesson objectives (slides 1-4) * Review Loops and ask students to share with a partner or the class when they might use loops in their animation (slide 5) |
| **Direct Instruction & Guided Practice:**   * (If necessary) Have students finish completing all sections of CoCo using their paper graphic organizer from the last two lessons. (slide 6) * Remind students that it is important to return to check for consistency between their final animation and their plan in CoCo. Their animations in Scratch should match what they planned in CoCo. If they do not, students should be careful to edit and make changes when necessary. They should always ask themselves: (slides 7-15)   + Do I have a topic sentence?   + Does my animation in Scratch convey what I planned? Does it match my writing?   + Remind them of example/nonexample (Optional) * Next, instruct students that, while their animation should match the purpose of their writing, there are ways to enhance their project or distract from their project using Scratch. Students should also consider: (slides 16-19)   + Have I enhanced my writing in anyway in Scratch?     - Show example and Non Example   + Is there anything distracting or unnecessary in my animation that I should remove? Is there anything in my animation that would make it harder for a viewer to understand my purpose?     - Show example and Non Example |
| **Independent Practice:**   * Once all columns and rows of CoCo are completely filled in, guide students to open Scratch and code their animation, toggling between CoCo and Scratch. (slides 20-21) |
| **Wrap up:**   * Have students check their animation in Scratch: (slides 22-23)   1. Does my animation in Scratch convey what I planned? Does it match my writing?   + Have I enhanced my writing in anyway in Scratch?   + Is there anything distracting or unnecessary in my animation that I should remove? Is there anything in my animation that would make it harder for a viewer to understand my purpose? * As students finish, assign them into groups of 2 and instruct the pairs to swap screens and share their work with a partner (slides 24) * **(Required)** Have students share their animations to the teacher’s Scratch studio (slides 25-27) |
| **Assessment Strategy:** Evaluate students’ planning document with a teacher-made rubric or focusing on a target skill based on the student’s area of need. |