

**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](mailto:achutchison1@ua.edu)

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| **Lesson 2: Introduction to Scratch & CoCo (~55 min)**  *Grades 3-4* |

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| **Concept:** | |
| **Vocabulary:**   * Algorithm * Commands * Code * Decomposition * Abstraction | |
| **Summary:**  In this lesson, students will review patterns and sequencing, and be introduced to algorithms, decomposition and abstraction. They will learn about the Compose and Code (CoCo) platform and use it to compose a set of written instructions (“algorithm”) to program a sprite to walk in a square. | |
| **Lesson Objectives (learning targets): I can…**   * Review the definitions of patterns, sequencing, and Scratch vocab * Define algorithms, decomposition and abstraction * Identify the purpose of CoCo * Write an algorithm for how to walk in a square * Identify the Scratch blocks used to program a sprite to walk in a square | |
| **Content Standard(s)** | **Computer Science Standard(s)** |
| The student will   * Use organizational strategies to structure writing according to type * Use transition words to vary sentence structure | The student will construct sets of step-by-step instructions (algorithms), both independently and collaboratively  a) using sequencing;  b) using events. |

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| **Materials** |
| **Lesson materials:**   * Chromebook/Laptop * Internet Access * Scratch Offline Editor (app) * Teacher slides * [CoCo Link](https://wego.gmu.edu/scratchgo/login.php) * Optional: Explanatory text [graphic organizer](https://www.dropbox.com/scl/fi/vkzkxmfgjmoeo0vxdzhbu/Explanatory-text-graphic-organizer.docx?dl=0&rlkey=0w3fkr02skm7kj7vkuyptl5ev)   **Supplemental resources:** |

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| **Lesson Structure and Activities** |
| **(5-8 min) 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: Introduce lesson, learning goals, and resources (Slides 2-5) * Review vocab from lesson 1 with matching activity (slides 6-7) * Play video introduction to Tess, a computer scientist at Google (slide 8) * Remind students of computational thinking skills and tell them today’s focus will be on algorithms, decomposition, and abstraction |
| **(30 min) Direct Instruction & Guided Practice:**  (20 min) Introduce Abstraction, Decomposition, & CoCo   * Introduce new vocabulary: algorithms, commands, code, sequence (slides 13-20) * Pause and reflect: why do patterns and sequencing matter when coding? (slide 19) * Introduce vocabulary: decomposition (slides 20-23)   + Ask students to think of examples of decomposition * Illustrate examples of decomposition in writing (slide 24) * Introduce abstraction (slides 25 - 28) * Explain that graphic organizers are an example of abstraction (slides 29 - 32) * Remind students of familiar graphic organizers to use while writing (slide 33) * Introduce the CoCo graphic organizer (slides 34 - 40)   + Discuss how CoCo helps us to organize and then publish our written ideas in an animation   + Go through the different columns of CoCo and their purpose * Share the Hot Cocoa animation as an example of a recipe written using CoCo and animated in Scratch! (slide 41 and also at <https://scratch.mit.edu/projects/833988634> )   (10 min) Introduce Algorithms and new Scratch blocks   * Explain that we can code algorithms in Scratch (slides 43-44) * Introduce new motion blocks: move, turn, and wait (slides 45-49) * Introduce new control block: wait block (slide 50-51)   + Note: Hyperlinked on each slide is an explanatory video for each new block introduced in this lesson. |
| **(15 min) Independent Practice:**   * (10 min) Instruct students to write an “algorithm” (set of instructions) in the first column of CoCo that would program a robot to walk in a square. Hint: students should use the verbs “turn” and “wait”, which also correspond to blocks in Scratch.   + Students who may wish to organize their thoughts in a graphic organizer before composing in CoCo may use the [explanatory text graphic organizer.](https://www.dropbox.com/scl/fi/vkzkxmfgjmoeo0vxdzhbu/Explanatory-text-graphic-organizer.docx?dl=0&rlkey=0w3fkr02skm7kj7vkuyptl5ev) * (5 min) Instruct students to read aloud their algorithm to a partner. They should check to see if their instructions make sense to the other person. * (Optional extension 1) Students can use CoCo columns 2-3 to begin planning a Scratch animation. * (Optional extension 2) If students have completely filled in CoCo, they can code their sprite to walk in a square in Scratch.   Optional support videos:   * Overview of CoCo level 4: <https://www.dropbox.com/s/2lsly3hgelvw3hg/Review%20of%20level%204.webm?dl=0> * Adding text to CoCo: <https://www.dropbox.com/s/h0yeiv8ckvghmjk/Adding%20Our%20Text%20to%20Coco.webm?dl=0> |
| **(5 min) Wrap up:**   * Quickly show students how this set of instructions could be translated to code in Scratch (slides 57-73) * Review lesson objectives for the last time and remind students that ANYONE can be a computer scientist! (slides 74-75) |
| **Assessment Strategy:**  Did the student…   * Review the definitions of patterns, sequencing, and Scratch vocab * Define algorithms, decomposition and abstraction * Identify the purpose of CoCo * Write an algorithm for how to walk in a square * Identify the Scratch blocks used to program a sprite to walk in a square |