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

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| **Unit 4 Lesson 1: Decomposition**  *3rd & 4th Grade* | | |
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| **Concept: Decomposition** | | |
| **Vocabulary:**  • Patterns, sequence, algorithm, abstraction (review)  • Decomposition  • Summaries  • Events and Loops | | |
| **Narrative/Summary:**  In this lesson, students will use a summary strategy to decompose a story in Coco. | | |
| **Lesson Objectives (learning targets): I can…**   * Review CS Vocabulary * Identify features in Coco Level 5 * Identify other types of writing (SUMMARIES) that could be used in Coco Level 5 * Identify and use NEW BLOCKS * Brainstorm new writing ideas with a partner | | |
| **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 break down (decompose) a larger problem into smaller sub-problems, independently or collaboratively. | |

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| **Materials** |
| **Lesson materials:**   * Chromebook/Laptop * Internet Access * Read aloud of [Little Red Riding Hood](https://www.youtube.com/watch?v=r_akuIFFpws) or a [story of your choice](https://www.dropbox.com/scl/fi/lesi8uwwck9kno1k5de2t/simple-stories-for-summarizing.doc?dl=0&rlkey=60w4qtxmjcwvl2udjklfy9qul) to summarize using SWBST * Teacher slide deck * [Coco Link](https://wego.gmu.edu/scratchgo/login.php) * [Scratch link](https://scratch.mit.edu/) * SWBST [Practice graphic organizer](https://www.dropbox.com/scl/fi/64of0bqyi4wub8xm9toxd/SWBST_Practice-graphic-organizer.docx?dl=0&rlkey=y7wyfpzguw46wnt301wq9nx20)   **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 5.** * **Please use the following naming strategy for assigning the story in CoCo:**   + “Unit # + Descriptor”, for example, “Unit 4 Summary” * **Students should use the same naming strategy for their final Scratch Project:**    + “Student Name + Unit # + Descriptor”, for example, “Johnny Unit 4 Summary” |
| **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 standard, the materials and resources needed for this lesson, and the lesson objectives (slides 2-5). * Review Computational Thinking vocabulary by having students share in small groups for a few minutes about one CT skill that helps them think like a computer scientist (slide 6). Introduce the term “decomposition”, ask students to share what they think decomposition means. (slides 7-8) * Introduce definition → (slides 9-10)   + Decompose (v): to break a problem down into smaller pieces   + Decomposition (n): breaking a large problem into smaller parts * Discuss as a class additional examples of decomposition in computer science and the real world (See examples below and in slides 10-11)   + Cleaning your room   + In nature: decomposers   + Solving Math problems   + Breaking down a calendar year into months and months into days   + Group dances–whether we do one we all know or make up our own! (like the macarena or maybe one from social media)   + **In CS: Breaking down a complex problem into smaller, more manageable parts** |
| **Direct Instruction & Guided Practice:**   * Explain that in literacy, we use decomposition quite often: (slide 12)   + When we sound words out (ex. mis-com-mu-ni-cate)   + When we edit and fix mistakes   + When we create a set of instructions   + When we share the main idea   + **When we create a summary of a story** * Ask students to share what a **summary** is. (slides 13-14)   + Define→ A summary restates the main ideas of a story in your own words.   + Explain that when we are summarizing, we are decomposing a story into the main parts. * Introduce summarizing strategy: Somebody Wanted But So Then (SWBST) (slide 15)   + Somebody: Character   + Wanted: Goal/motivation   + But: Conflict/problem   + So: Resolution   + Then: How does it end? * **Using a story or text of your choice, guide and model how to use SWBST with the class** OR (Optional) Stop and listen/[watch](https://www.youtube.com/watch?v=r_akuIFFpws) the story of Little Red Riding Hood. (slide 15) * Model how to use level 4 of CoCo by using it to write a summary of the story you choose (or Little Red Riding Hood) using the SWBST strategy. You may also wish to use [this video model](https://www.dropbox.com/s/63as0v6vnl7xepv/SWBST%202%20min..webm?dl=0) (slides 16-17) * Instruct students to get with a partner to practice summarizing a familiar story or one that the teacher assigns. They may have a story or text they have been reading or the teacher can provide one. (slide 18)   + They may use the [paper graphic organizer attached here](https://www.dropbox.com/scl/fi/64of0bqyi4wub8xm9toxd/SWBST_Practice-graphic-organizer.docx?dl=0&rlkey=y7wyfpzguw46wnt301wq9nx20) |
| **Direct Instruction & Independent Practice in Scratch:**   * Explain that we have learned about loops and events before, today we will learn a few more (slide 19) * Introduce Events and new event blocks (slides 20-23)   + Events in computer science are the triggers for making action happen, like selecting the play button on any screen. Events in Scratch are represented by the yellow codes including: when flag clicked, when sprite clicked, when key pressed     1. Model New Event blocks (when sprite clicked, when key pressed)     2. Instruct students to try each out on their own in Scratch        1. Instruct students to create an animation of a sport or outside activity they like to do with two Sprites. Use one of the new event blocks for each Sprite. Share with a partner! * Remind students of Loop Blocks they have learned (Repeat Until & repeat X number of times) (slide 24) * Introduce “Forever” Block (slides 25-27)   + 1. Blocks held inside this block will be in a loop — just like the Repeat () block and the Repeat Until () block, except that the loop never ends (unless the stop sign is clicked, the Stop All block is activated, or the stop script block is activated within the loop). Due to this infinite loop, the block has no bump at the bottom; having a bump would be pointless, as the blocks below it would never be activated.     2. Instruct students to try out the “Forever” block in Scratch        1. Navigate to scratch.mit.edu        2. Create a new project        3. Choose a Sprite        4. Animate a dance with five or more moves        5. Using the loop function, have the sprite dance using both “Repeat until” and “Repeat \_\_ Number of times” and “Forever” |
| **Wrap up:**   * Have students get with a partner or small group and discuss when they may want to use a Forever block in their coding. (slide 28-29) |
| **Assessment Strategy:** As students work, check for understanding of how to use the new blocks introduced in today’s lesson. |