**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)

| **Unit 2 Lesson 1: Abstraction** *3rd & 4th Grade* | | |
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| **Concept: Abstraction** | | |
| **Vocab:**   * Pattern, Sequencing, Debugging, pair programming, and Scratch features (optional review) * Abstraction | | |
| **Narrative/Summary:**  In this lesson, students will be introduced to abstraction in computer science and instructional writing. They will practice abstraction in writing by filling in a graphic organizer with a set of “how-to” instructions. | | |
| **Lesson Objectives (learning targets): I can…**   * Review the concepts and skills from last time * Define and identify examples of abstraction in writing and computer science * Write a set of “how-to” instructions using a graphic organizer * Identify and use Scratch Sound Blocks | | |
| **ELA Standard(s)** | **Computer Science Standard(s)** | |
| The student will use effective communication skills in a variety of settings:   * Use active listening strategies including but not limited to making eye contact, facing the speaker, asking questions, and summarizing: * Orally summarize information expressing ideas clearly.   The student will read and demonstrate comprehension of nonfiction texts  The student will write in a variety of forms to include narrative, descriptive, opinion, and expository | The student will construct sets of step-by-step instructions (algorithms), both independently and collaboratively  a) using sequencing;  b) using events. | |

| **Materials** |
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| **Lesson materials:**   * Chromebook/Laptop * Internet Access * [Teacher Unit 2 Slides](https://drive.google.com/file/d/1CTtl4d0v6gol47VFna5Fvf3bvCEXv5vg/view?usp=drive_link) * [Student slides](https://docs.google.com/presentation/d/1EoDvurQkNDAAWfzlp1MGfM6vJ8-a3UGH/edit?usp=drive_link&ouid=104701427422211502426&rtpof=true&sd=true) * Scratch link: <https://scratch.mit.edu/> * CoCo link: <https://wego.gmu.edu/scratchgo/login.php> * [Explanatory text graphic organizer](https://docs.google.com/document/d/1vErwJuVGUuhXYRWeqYPrYFtqu1eleKSP/edit?usp=drive_link&ouid=104701427422211502426&rtpof=true&sd=true)   **Supplemental resources:**   * [Video solution to warm up puzzles](https://www.dropbox.com/s/yyfy614h2fyu3w2/DogPuzzleVideo.mp4?st=qfbllxu3&dl=0) * [Instructions for How to Share Scratch Products](https://www.dropbox.com/scl/fi/5tyqclimfyxm5w0oduo8i/How-to-Share-Scratch-Products.docx?rlkey=25bxkepw2rdt6hq0pe55ji3ph&st=6ehw2oob&dl=0) or [video](https://www.dropbox.com/scl/fi/k2t7ydsi6sdans7gohpft/Student-How-To-Add-A-Project-To-A-Studio-In-Scratch.mp4?rlkey=6jmehhmfutgb3jiirjxynvf29&st=cifroqna&dl=0) |

| **Lesson Structure and Activities** |
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| **Introduction (10 min):**  **NOTE: Most 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 as well as the materials and resources needed for this lesson (slides 2-3). * Guide students through a review of concepts from Unit 1 by having them complete a new set of [Sequence Puzzles](https://docs.google.com/presentation/d/1EoDvurQkNDAAWfzlp1MGfM6vJ8-a3UGH/edit?usp=drive_link&ouid=104701427422211502426&rtpof=true&sd=true) (Slide 4). * [Share answers](https://www.dropbox.com/s/yyfy614h2fyu3w2/DogPuzzleVideo.mp4?st=qfbllxu3&dl=0) to the slide puzzles (slides 6-9). |
| **Direct Instruction (5-10 min): Abstraction**   * Introduce the concept of abstraction in writing and computer science; provide definition that abstraction is “identifying what is important and leaving out information we do not need” (Slide 10-11). * Show examples of abstraction: maps, outlines (slide 12). * Show [video](https://www.dropbox.com/scl/fi/0l160n4qly9w04oefcd9v/Abstraction.mp4?rlkey=oas8j0ldwuvrcq76q1jnxpaww&st=xejxl246&dl=0) defining abstraction (slide 13). * Model how abstraction involves the creation of templates that are efficient and replicable. In writing, give the example of graphic organizers. In Scratch, give the example of making one’s own blocks (slides 14-17). |
| **Independent Practice (15-20 min): Writing instructions**  *(Students may work in pairs or independently.)*   * Direct students to open their student slides OR push the [Explanatory text graphic organizer](https://docs.google.com/document/d/1vErwJuVGUuhXYRWeqYPrYFtqu1eleKSP/edit?usp=drive_link&ouid=104701427422211502426&rtpof=true&sd=true) (Slide 18) * Students will work in their own copies of the handout to write their own set of instructions (slide 18-19). * Instruct students to keep their instructions because they will use them in the next lesson. |
| **Direct Instruction & Independent Practice: Scratch sound blocks**   * Introduce new Scratch Sound Blocks: (slides 20-25)   + Play ([explainer video](https://www.dropbox.com/s/91zl6guqvnzviah/playsounduntildone.mp4?st=j9hwiw6y&dl=0))   + Choose, upload, or record a sound ([explainer video](https://www.dropbox.com/s/lsk2z2cua8i33c0/ChooseRecordUploadApril.mov?st=180d8hf5&dl=0))   + Change pitch ([explainer video](https://www.dropbox.com/s/owv274u8nvlohn6/ChangePitch.mov?st=l4lsc3hn&dl=0))   + Stop all sounds ([explainer video](https://www.dropbox.com/s/8ujwwz1ub6k5ysm/stopallsounds.mp4?st=v0tk9d68&dl=0)) * Instruct students to try out the new sound blocks by 1) choosing an animal that is not a cat as their sprite and changing the sound of their animal and 2) voice recording the sprite saying at least one line of their written instructions in Scratch. (slides 26-27) |
| **Wrap up: (2 min)**   * Remind students to share their Scratch creation to their teacher’s studio.(slides 28-30)   + You may reference these [optional instructions](https://www.dropbox.com/scl/fi/5tyqclimfyxm5w0oduo8i/How-to-Share-Scratch-Products.docx?rlkey=25bxkepw2rdt6hq0pe55ji3ph&st=6ehw2oob&dl=0)  or [video](https://www.dropbox.com/scl/fi/k2t7ydsi6sdans7gohpft/Student-How-To-Add-A-Project-To-A-Studio-In-Scratch.mp4?rlkey=6jmehhmfutgb3jiirjxynvf29&st=cifroqna&dl=0) if needed. |
| **Assessment Strategy:**  Did the student…   * Review the concepts and skills from last time * Define and identify examples of abstraction in writing and computer science * Write a set of “how-to” instructions using a graphic organizer * Identify and use Scratch Sound Blocks |