Lesson 3: Order Matters

Powerful Ideas of Computer Science	Algorithms
Powerful Ideas of Literacy	Sequencing, Editing and Audience Awareness
PTD	Choices of Conduct, Communication, Community Building
Palette of Virtues	Open-Mindedness, Patience, Curiosity
Children will be able to…	• Compare and contrast humans and computers in terms of their characteristics and languages used to communicate with them. • Define algorithm. • Identify the importance of order in algorithms.
Vocabulary	• Order: the way a list of things is set up. Order matters in both human and computer languages. • Algorithm: Instructions for a computer to solve a problem in a particular order
Teacher Preparation	• Read lesson plan. • Print one copy of the Cut Out Words file per child and cut each word. Make sure to shuffle the sets but not mix them. • Print Lesson 3 Design Journal for each child or refer to Full Design Journal. • Teacher Project: Create a simple project with no more than 4 Blocks or pull up the project made in Professional Development.

Warm Up

- **Word Scramble** *(Suggested Time: 5 minutes)*
  - Remind children that ScratchJr is a programming language: a language we use to talk to computers. Explain that all different languages need words to be put in a certain **order** to make sense.
  - Use Cut Out Words of the sentence ("The cat is on the mat"), scramble them, and read out/have someone read the scrambled sentence (e.g., "mat the on is cat the").
  - Discuss if this makes sense and ask children to put the words in the right order.
  - Explain that language needs to be in the right order to be understood.

Opening Tech Circle

- **Human and Computer Language** *(Suggested Time: 10 minutes)*
    - Computer language is about giving instructions or telling what to do. When a human is talking to another human, they can ask questions, tell stories, give instructions, tell jokes, etc., but when talking to a computer, they can only give instructions.
    - Computer instructions are called **algorithms**.
    - Explain that algorithms are a list of steps in the right order.
    - Go over an example with the children: Washing your hands.
        - Instructions: If a human were telling another human to wash their hands, they'd know what to do!
        - Algorithm: Now pretend a computer has hands! If a human told a computer to wash their hands, the computer would have no idea what to do! You'd need to tell them about each step in the right order.
            - Walk to the sink.
            - Turn on the water.
            - Put your hands under the water.
            - Put soap on your hands.
            - Scrub and rinse
            - Take hands out of water.
            - Turn off sink.
            - Dry hands

Word Time

- **Lesson 3 Design Journal** *(Suggested Time: 10 minutes)*
    - Remind children how important it is to put things in the correct order when giving instructions. Have children open their Design Journals to Lesson 3 and decide how to brush their teeth by circling the appropriate image for the first, second, third, and last steps.

Unplugged Time

- **Program the Teacher** *(Suggested Time: 10 minutes)*
    - Tell children that the teacher will now be the computer, and they will get to program them! Remind them that they need to say all the steps in the right order using respectful words!
    - Children will be responsible for verbally directing their teacher to special destinations in the classroom (e.g., to a bookcase or a closet) or doing a task (e.g., making a sandwich).
    - The instructions the children give to the teacher must be specific. For example, children should not simply say, "Move forward." They should instead say, "Move forward ____ steps." or "Put the peanut butter on the bread" should be, "Open the peanut butter jar and use your knife to scoop the peanut butter onto the bread."

        - The teacher should "misinterpret" the children's answers based on lack of specificity. For example, if the child tells the teacher to turn, the teacher can spin in a full circle.
    - Discuss how important it is to be specific and how important order is in programming.

ScratchJr Time

- ***Structure Challenge:*** **What is Cat Doing?** *(Suggested Time: 5 minutes)*
    - Share your ScratchJr project again with the class. This time, show the code and explain that the blocks are in a particular order so that they do exactly what we want them to do! It is an algorithm when we order the blocks in a certain way.
    - Ask children to look at the blocks used in the teacher's program and ask if they know why the teacher used them. Encourage children to ask questions, make mistakes, and think rather than give away the right answer.

Closing Tech Circle

- **Programming Clean Up** *(Suggested Time: 5 minutes)*
    - Remind the children of the *Clean Up Song* and the rules they learned in the previous lesson and then have the children program the teacher to put away their devices.

(to the tune of the Itsy Bitsy Spider)
We're turning off our devices and putting them away
We had so much fun but we're finished for the day
We're using both our hands and we walk instead of run
We put away our devices and now the song is done