Lesson: Introducing Procedural Problem Solving
Introduction to Computer Science

Context:
This lesson is made to introduce procedural thinking to students. Beginner-level programming is constructed in a procedural manner where the computer reads instructions line by line until all the instructions the programmer writes are complete. Developing a mindset to deconstruct a problem to simple steps is vital to being able to translate these steps into a programming language. This process is a large hurdle new programmers face in learning how to code.
Exploring this process and learning this problem solving method is useful for programmers in solving problems, but also collaboration. Working in teams is the industry standard for programmers, and also most other industries. By practicing communication in a structured format, directions and desires will be accurately conveyed between one another.
This course and lesson was designed for high school students in their first year of programming.

Objective:
Students will be able to develop a procedure that instructs a user to recreate an object.

Procedure:
- Warm-up: What is your routine to get ready for school?
    - Students will think independently for a couple of minutes on what their daily routine consists of.
    - I will poll the class for their answers.
    - This warm-up aims to have students think about what makes a full procedure and what steps are necessary to make up an action.
    - The detail in which the students describe their actions represents the difference in programming languages.
- Procedural Programming: What is this?
    - This lesson will dive into what procedural programming is and why it is useful for us.
        - It is an intuitive and simple way to solve a problem.
        - Effective for now, but will be expanded to be stronger in the future.
- Procedural Instructions: Write-it Do-it activity
    - Using the Science Olympiad event of Write-It Do-It as a reference, students will be split up into pairs.
    - Each member goes to a different side of the room where they will have a collection of objects arranged to make a sculpture.
    - They will be given 5 minutes to write out instructions for their teammate to recreate this sculpture with the given objects.
    - After the 5 minutes, the sculpture will be taken apart to its basic objects.
    - Pairs will switch places with one another and have 10 minutes to use the instructions to recreate the original sculpture.
    - After, the pairs will get together and go through the sculptures to see what misunderstandings took place when recreating the sculpture.

        - This helps students receive personal feedback on their ability to write and follow directions.
    - Students will repeat this with the option of changing their partners.

Preparation:
NYSED Computer Science Standards
9-12.CT.10
Collaboratively design and develop a program or computational artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users

Student Questions:

Inclusiveness:
UDL Principles.
Representation:

- There are many tips and important factors to address when writing a clear procedure, but this activity has the students explore and see the value in these factors. Rather than giving a structure for students to follow, this activity encourages flexibility in their thought process which aids in their flexibility to solve problems in

Action and Expression:

- Students are given the freedom to write out their procedure in whichever way they choose. However, they have to address it to another student, so there is some limitations in their expression. Catering your response to fit an audience is

Engagement:

- To account for differentiation, I will include a variety of sculptures varying in difficulty for the activity.