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Class: Intro to Computer Science

Unit: Algorithm Writing/Conditional Applications

Lesson Topic: Day 9-10 Game of Nim Algorithm/Code

Lesson Objective:

- Create a working version of the Game of Nim

SWBAT:

- Identify the steps needed for a round of the game of nim
- Implement the steps for the game of nim into an algorithm
- Create a working version of the game of nim as a form that others can play.

Standards:

- 9-12.CT.9 Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.
- 9-12.CT.4 Implement a program using a combination of student-defined and third-party functions to organize the computation.
- 9-12.CT.8 Develop a program that effectively uses control structures in order to create a computer program for practical intent, personal expression, or to address a societal issue.

Teaching Tools:

- Visual Studio 2019, Smart Notebook, Google Docs, Game of Nim Website

Procedures:

- **Do Now:** Students will click the link posted on google classroom and will play the game of nim a few times.
- As a class students will discuss the process of a single turn for the game of nim and then the teacher will read the prompt for their final assignment and demo a working version.
    - The key points to highlight in the discussion are the following: user entry, calculation, check for win, display user turn, computer turn, calculation, check for computer win, display computer turn
    - The key points should be written on the board and will reflect the pseudocode which is given to students in their algorithm writing form.
- Students will complete the algorithm writing process and will be given 10 (paper) stones and will play the game of nim to ensure it works as intended before moving on to coding.
    - This step is important because it gives them manipulatives to test their code and see if it works as intended. The manipulative may highlight errors in their algorithm that they can refine before coding.
- Students should apply their algorithm in a form with a play round button.
    - Students should work on their projects independently and since this is a final project there should be little teacher intervention unless a student is really struggling.