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Class: Intro to Computer Science

Unit: Algorithm Writing/Conditional Applications

Lesson Topic: Day 1 What is an algorithm?

Lesson Objective(s):

- Define an algorithm
- Review key concepts which will be used throughout the unit
- Develop strategies for structuring a larger project

SWBAT:

- Create a working algorithm for a guessing game program.

Standards:

- 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.
- 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.

Teaching Tools:

- Google Slides
- Visual Studio 2019
- Paper cut outs of smore material

Procedures:

- **Do Now:** To begin the lesson students will think-pair-share what their idea of an algorithm is.
- After a class discussion about the key question “What is an algorithm?” it will be formally defined for students and as a class students will discuss an algorithm they should all be familiar with which is the process for long division.
    - Teacher Prompts: The goal of the slides is to begin having students thinking about the order and structure of a more complex operation. This portion of the lesson is mainly direct instruction off of the slides.
- Students will be placed into groups of 3 to form and given a bag of materials for making smores students will be given time to first discuss the order of events and then record their algorithm in a document for submission. Finally students will be given representatives of the elements of smores (marshmallows, fire, graham crackers, chocolate, and a stick) and they will apply their written algorithm and see if they can identify any issues.
    - Goal of this prompt is specifically to get students to think about the structure and order of a multi step operation. The creation of smores is relatively simple but the steps are ordered. If they are done incorrectly they can have some funny results. The application of their written algorithm is used to represent the debugging process.

    - **Teacher prompts:** As students are working, the teacher will circulate the room and discuss with students their algorithm. The teacher should be looking to highlight potential flaws for the group to discuss. Example: taking the marshmallow off of the stick before placing it on the graham cracker. What if the marshmallow catches on fire?
- Teacher will demo the guessing game program and similarly to the smores algorithm students will be given time to first discuss how the code works and then place their idea for the order of the code in a word document
    - Goal is to scaffold the creation of a larger project with alot of elements and to generate discussion about those elements. The 4 main elements students will need to consider in order: **user input, generation of the random number, conditionals, what to return and where**
    - **Teacher prompts:** make sure students have at least considered all of the 4 key elements and break for full class discussion if many groups seem to struggle with this assignment