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TTH 2 - 3:15
PEEE

Programming Integration in the Education Classroom

As preservice math teachers, we believe that programing in the classroom can be a great way to not only introduce coding, but help students make connections between math and coding. We believe that coding can be used to talk about variables, order of operations, geometry, and much more.

The first most important part of coding is the sequencing. In coding, the order that you put actions in is incredibly important if you want the program to run correctly. We believe this is directly tied to order of operations in math, and that a simple coding lesson could allow students to see why it is important to do things in a certain order, for programs and for math problems. With using a program such as Scratch, we could create a lesson that we would do as a group with the students with having a sprite draw a square. With this lesson, we could have students come to the board and change aspects of the program to see what would happen, and how the simple order of the blocks or the direction the sprite turns can drastically change the outcome. This will be related to a math problem where order of operations is incredibly important to get the correct answer, and students will be able to connect the coding to this.

We can use variables to create blocks and make the code to create different versions of what we have made. This can show students that using variables such as X can be substituted for any number and there will be a pattern within the answers and for example in the Scratch program if we changed our variable it would make a bigger or smaller shape. This can also allow students to understand what a function can do when using variables. We could show the students

a function on Scratch to create a square, when we put a variable into the function however, we will be able to show how the square would change due to whatever number was input to the function. This also can become important when starting to go more in depth about geometry.

Geometry is present when coding and math because it gives students a chance to see angles and degrees put into perspective on a Scratch program we create. Using this program we will be able to teach students the relationships between the number of sides in a shape and their angles, as a regular shape. For example, when creating a shape on Scratch with user input, we have to create a function that allows for a polygon with ny number of sides. To accomplish this, we had to tell the sprite to turn the correct number of degrees in order for the shape to turn out. We will explain that in order to do this, we put in an operation that said [turn right (360 / sides)]. This operation showed the relationship between sides and angles, showing that all regular shapes will have angles that are equal to 360 degrees divided by the number of sides. It is a difficult concept to understand and would use lot of work with coding to get through to the students. In the end however the hope is that students will be able to see this relationship.

Programing in a math classroom in an incredibly important tool for any teacher to use. Any programing the students can be exposed to can really help them get the connections they need to understand different concepts in math, even if it's as small as sequencing. This little bit of exposure can go a long way with a students success in math, as well as coding.