**Algorithm Activity**

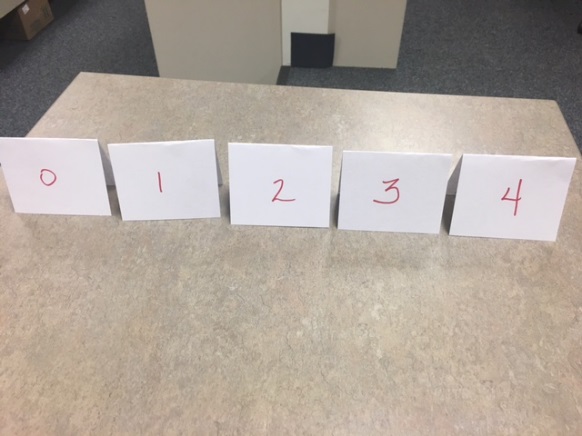
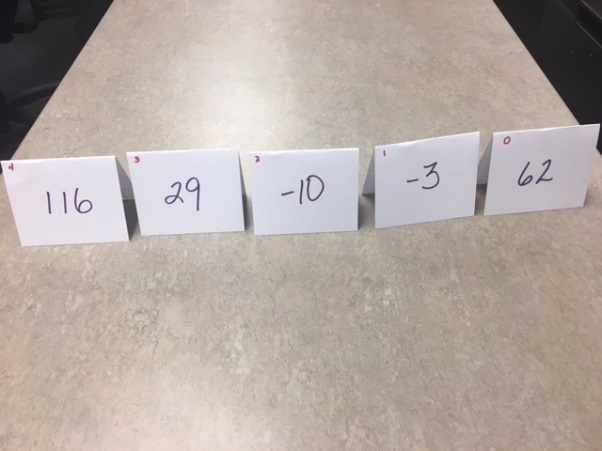
**Finding a Minimum in an Array of ints**

**Introduction**

In this activity, you will design an algorithm to find the smallest item in an array.  If a human being had a list of numbers, we could just have the person tell us the smallest number. Unfortunately this may not work for a computer. We need to tell the computer the process to find a minimum value in an array. Today you will write the process to find a minimum value in an array.

**Instructions**

* You will work in groups of 3. Each group should take some time to brainstorm ideas for the process of finding a minimum. You should write down your process in a step by step format. When you have your algorithm written down, show it to me for approval to move on to the next step.
* After I approve your algorithm (this just means I am willing to let you test it…your algorithm may not be totally correct!), take at least five index cards. Fold index cards in half. On one side write the index numbers. On the other put the index numbers in the top corner and the values being stored on each card. In the picture, the red numbers are the index numbers and the purple numbers are the values stored in the array.

* Test your algorithm using the cards in the group. Your roles are as follows:
* Student #1 should be on one side of the cards with only the index numbers showing. You will read the algorithm step by step exactly as it is written.
* Student #2 should be on the side with the values. You should do exactly what is read from the algorithm.
* Student #3 should be writing notes on what is working and what needs to be improved upon.
* After the algorithm is completed, check the array to see if your algorithm did indeed give you the minimum value.
* After testing, adjustments should be made to your algorithm if necessary. Make your adjustments in a different color ink so you can track what changes are made. Then testing should be repeated and adjustments made until your group feels the algorithm is working for all cases. Be sure to test different values and sizes of the array before they are satisfied what you have works!
* When you think you have completed the testing and adjusting, trade algorithms with a different group. Test the other algorithm and determine if it works for all cases. Provide written feedback and suggestions for the other group to improve their algorithm and return the algorithm to them.
* Based on the testing and feedback from the other group, each person should try to implement the java version of the algorithm in a class. Add the method below to the ArrayPractice class we started earlier:

**public int findMin()**