Example of Active Learning Activity Used in Class:

This active learning activity, called the "work problem activity", comes from my Math 1010 course. I start by asking students to read and think to themselves about how they would solve the problem given below:

The roof of Finn and Paige's townhouse needs to be reshingled. Finn can do the job alone in 8 hours and Paige can do the job alone in 10 hours. How long will it take the TWO of them, WORKING TOGETHER, to reshingle the roof?

This problem is known as a "work problem" and it is the first of these types of problems seen in our class, so students are usually unaware of how to solve it. Instead of me simply telling them how to solve these types of problems with a given formula, I tell the students that we are going to put ourselves *inside* our own work problem. My goal with doing this activity is to help students recognize common errors made in these types of problems, by actually putting them in one.

I start by telling the students for *our* problem, "one full job" is to write the numbers from 1-20 on the board. I have a volunteer come up to the board and another volunteer get out a timer and time how long it takes for the student to write the numbers from 1-20 as fast as they can. Once they are done, the class agrees that student A has completed one full job in x amount of seconds. I then ask a second student to come up and do the exact same thing but just write the numbers out at a normal pace. This student is also timed and once the numbers from 1-20 are all written out, the class agrees that student B also completed one full job, (but at a slower pace).

I then pose the question: "While keeping their same paces, what if student A and student B worked *together* to write the numbers from 1-20 on the board (with student A starting at 20 working their way down, and student B starting at 1 working their way up until they met in the middle), about how much time would it take? I open it up for classroom discussion, and have students write down their guesses for times. During this guided discussion, I try to uncover common misunderstandings that many people have with these types of problems. The three most common mistakes being: a) Adding the times together, b) Averaging the times and c) Assuming that each person completes "half" of the job (which they don't because they are working at different paces).

At the end of our discussion, most students confidently come to the conclusion that the time it will take both students working together on the "job" will be less than either one of them doing the whole "job" alone. Usually a few students can even help me derive the formula for figuring out how much time it will take for the two students working together to complete the job. The formula is as follows,

Let a = the amount of time for Student A working alone to complete the job,

Let b = the amount of time for Student B working alone to complete the job,

Let t = the amount of time it takes Student A and Student B working together to complete the job then,

$$\frac{t}{a}+\frac{t}{b}=1$$

After the discussion, we have the two students work together to write the numbers from 1-20 and see if our prediction of time is close to correct.

Putting the students inside of a "work problem" helps guide them through the problem solving process in an active way. I see the students really actively learning instead of simply hearing me tell them the formula to use and when to use it. After participating in *our* work problem, we then complete the original problem given in the warm-up with much more ease. I end by having students reflect on this activity by comparing how they thought about the problem originally with how they think about it now.