

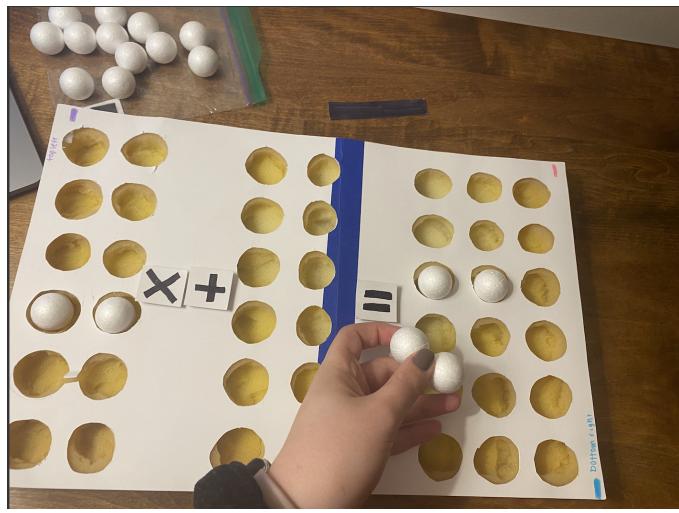
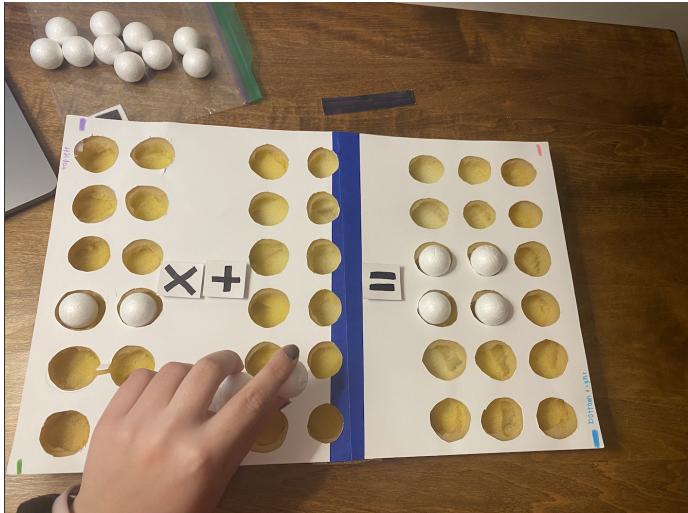
1. Begin with the board empty, placed in front of the student, with all digit and variable pieces off to the side



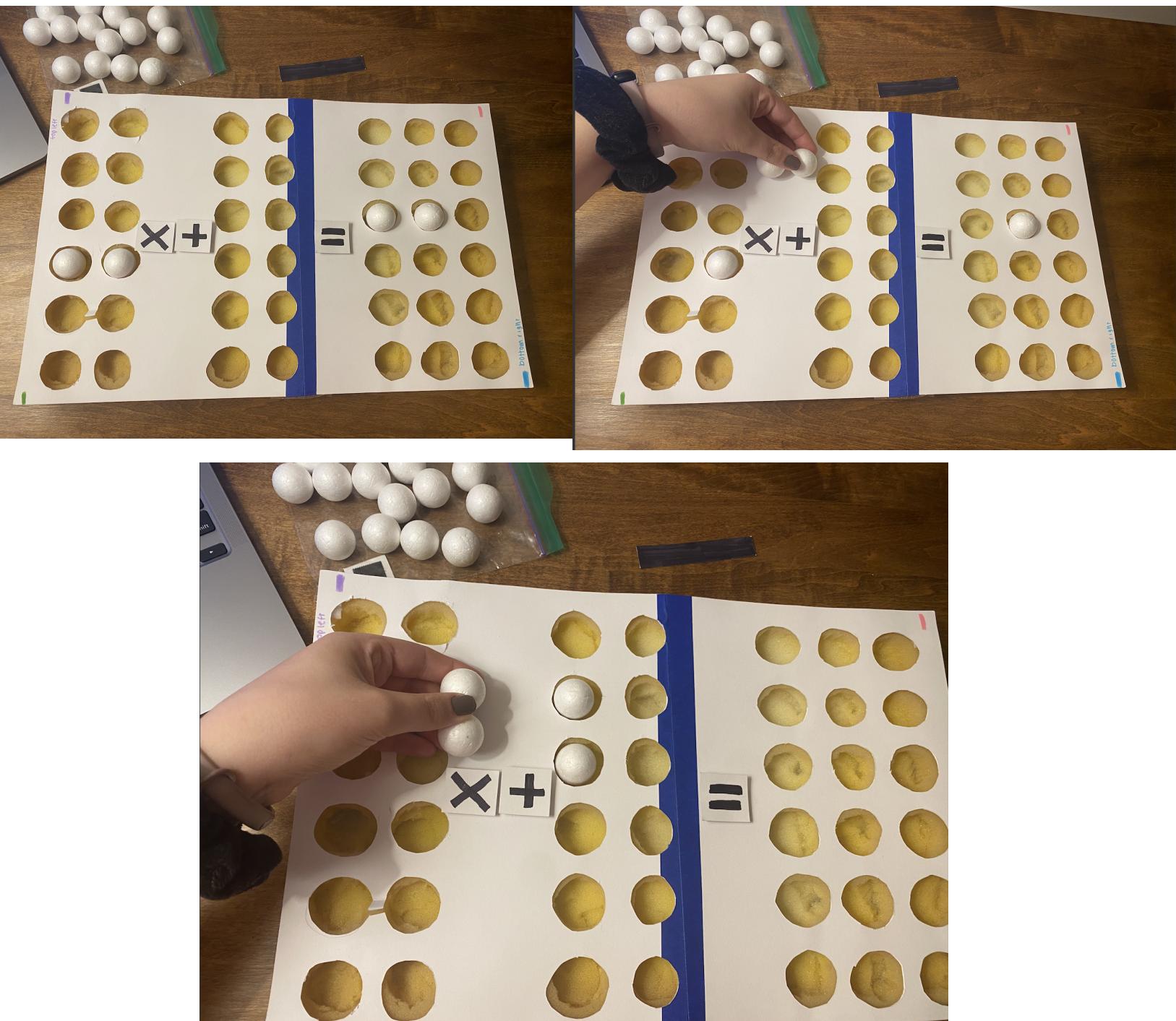
2. Display an equation to the student and ask them to represent it using the variable/digit pieces. Write this equation out on a piece of paper, with plenty of space below it to show simplifying steps.
  - a. Example equation:  $2x + 2 = 4$ . The equation will be limited to  $x$  and integer digits for now.



3. When the student has properly represented the equation using the pieces, ask them to move pieces around the board to get the x's alone on one side, and digits alone on the other side. There is one rule - whatever is done on one side of the equals sign must be done on the other.
4. As the student moves pieces, copy their moves into mathematical operations on the original equation.
  - a. An example would be if the student removes two digit balls from both sides, show this by writing a “-2” in the corresponding columns of the written equation, and then writing the new equation with 2 subtracted from each side.



5. If the student reaches a point where they have only x's on one side of the equals sign and only digits on the other side of the equals sign, instruct them to distribute the digits evenly among the x's.
- a. If this confuses the student, equate to tangible objects like cookies (digits) among kids (x's)



6. The number that each x has is what x equals. Write this out and show that their physical actions induced this result.

