**Problem 2)** You have 20 M&Ms bags. 19 bags have 1.0 gram pieces, but one has pieces of weight 1.1 grams. Given a scale that provides an exact measurement, how would you find the heavy bag? You can only use the scale once. 30%

I would find the heavy bag by starting off with one m&m from the first bag and incrementing the amount of m&m’s I take from the following bags by one. If all the bags had 1.0 gram pieces, I would’ve ended up with

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 210

However, one of the bags has 1.1 gram pieces. Since every value that is being added up is unique, we can tell which bag has the 1.1 gram pieces by subtracting the total sum by 210. Then, you multiply the result by 10, the product, *n*, is the *nth* bag containing the 1.1 gram pieces.

For example,

If the result of the total sum is 210.5

210.5 - 210 = 0.5 x 10 = 5

Therefore, the 5th bag has 1.1 gram pieces.