Baseball Math

How to play: You will be using two colored dice to play baseball. You bat by rolling the dice and multiplying the numbers rolled. Each product is assigned to an event (Out, 1st base, 2nd base, 3rd base, or homerun). A player already in a base proceeds to the next base if their teammate bats to their original base, so a player in 2nd base will proceed to 3rd if their teammate bats and ends up going to 2nd base. There are no strikes or fouls, and a team scores by number of runs to home plate.

1. Compute all possible products after rolling two dice. Make a table of all the possibilities of a roll. How many entries would your table have? Do all the numbers from 1 up to the number of possibilities show up? Why or why not?

2. Strategize which products you want to assign to an event. You must assign at least 8 products to *Out* and no more than 2 to *Home run.*

Event	Products
Out	
1^{st}	
2^{nd}	
3^{rd}	
Home run	

Explain your reasoning. How does your rule compare to Mela's rules on the board? Compare the probabilities a player would get an out, 1^{st}, 2^{nd}, 3^{rd} base, or home run for Mela's rules and your rules.

3. Fill in the table below.

Product																		
Probability																		

4. Fill in the probability table below.

Probability	Outcomes or products

5. Now that you have the probabilities for each product or event, would you change the rules in question 3? Why or why not?

6. How many different outcomes would we get if we played with three 6-sided dice? What about four? Five? Explain your answer.

7. What if we play with two 8-sided dice, would the previous rules have to change? What about if we play with two 12-sided dice? Go through the steps or questions above for 8 and 12-sided dice and compare the rules of the game. How would you keep the probabilities of each player getting an out, 1^{st}, 2^{nd}, 3^{rd} base, or home run the same?