12.06.2023 Non-transitive Dice

RED = {1, 1, 6, 6, 8, 8}
GREEN = {2, 2, 4, 4, 9, 9}
BLUE = {3, 3, 5, 5, 7, 7}

Red Vs. Green

Red 1: $\frac{1}{3}$	Green 2: $\frac{1}{3}$	: 33% Win
Red 6: $\frac{1}{3}$	Green 4: $\frac{1}{3}$	: 33% win
Red 8: $\frac{1}{3}$	Green 9: $\frac{1}{3}$	: 100% win

$\frac{1}{3} \times 100\% + \frac{1}{3} \times 33\% + \frac{1}{3} \times 33\% = 56\%$

Green would win Vs red.

Red Vs. Blue

Red 1: $\frac{1}{3}$	Blue 3: $\frac{1}{3}$	: 33% win
Red 6: $\frac{1}{3}$	Blue 5: $\frac{1}{3}$	: 33% win
Red 8: $\frac{1}{3}$	Blue 7: $\frac{1}{3}$	: 67% win

$\frac{1}{3} \times 67\% + \frac{1}{3} \times 33\% + \frac{1}{3} \times 33\% = 44\%$

Red would win Vs. blue.

Blue Vs. Green

Blue 3: $\frac{1}{3}$	Green 2: $\frac{1}{3}$	: 0% win
Blue 5: $\frac{1}{3}$	Green 4: $\frac{1}{3}$	: 33% win
Blue 7: $\frac{1}{3}$	Green 9: $\frac{1}{3}$	: 100% win

$\frac{1}{3} \times 0\% + \frac{1}{3} \times 33\% + \frac{1}{3} \times 100\% = 44\%$

Blue would win Vs. Green

It is a good idea to let Charlie go first as you can pick the die that would most likely win against his. If he picks Red then pick green; if he picks blue, take red; if he takes green, then pick blue.