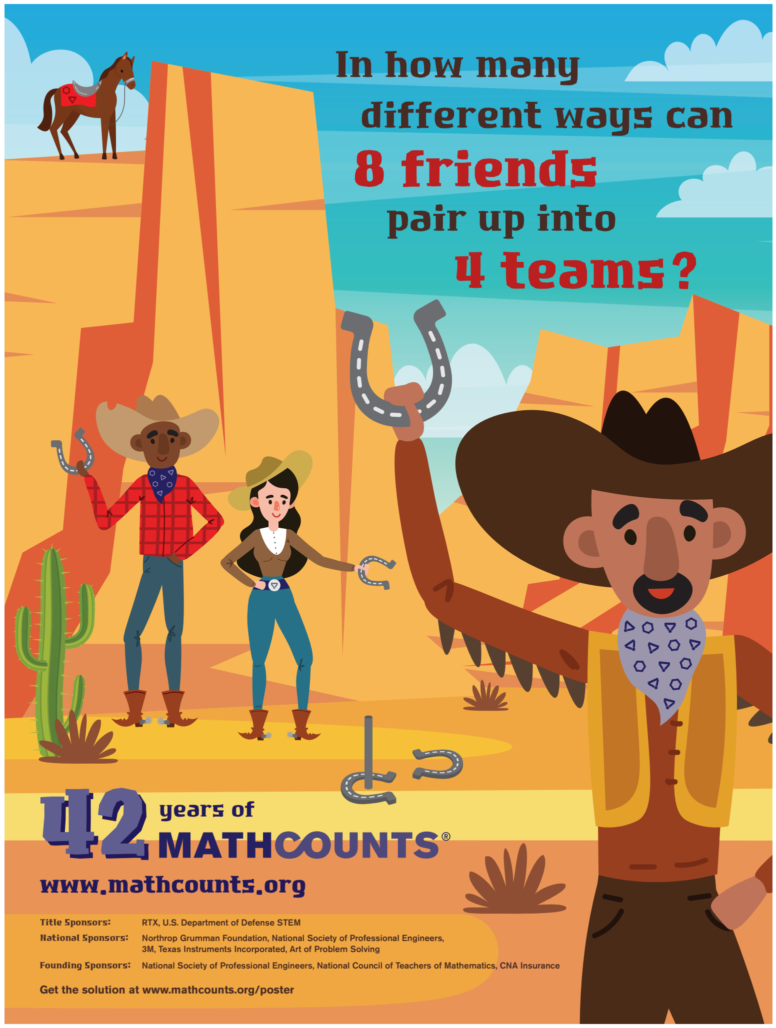
## MATHCOUNTS 2024–2025 Handbook Poster Solution




We can start by choosing the first pair from the 8 friends, which can be done in 8 choose 2 = 8!/(6! × 2!) = (8 × 7)/(2 × 1) = <u>28</u> ways. After selecting the first pair, we are left with 6 friends, and we can choose the second pair in 6 choose 2 = 6!/(4! × 2!) = (6 × 5)/(2 × 1) = <u>15</u> ways. For the third pair, we select 2 out of the remaining 4 friends, which can be done in 4 choose 2 = 4!/(2! × 2!) =(4 × 3)/(2 × 1) = <u>6</u> ways. Finally, the last pair of the remaining 2 friends can only be chosen in 2 choose 2 = 2!/2! = <u>1</u> way. Multiplying these combinations together, we get 28 × 15 × 6 × 1 = <u>2520</u> ways. However, since the order in which the pairs are chosen does not matter, we must divide by the number of ways to arrange the 4 pairs, which is 4! = 24. Therefore, the number of distinct ways to pair off the 8 friends into 4 teams of 2 is 2520/24 = **105** ways.