Russian Roulette

Contributed by David Reiman

Adam, Braxton, and Craig all decide to play a special kind of Russian roulette. They put a bullet into one chamber of a six-shooter and then each spins the barrel and points the gun at his feet and pulls the trigger. They keep playing, passing the gun around in order, until the bullet has been fired. If the order goes Adam–Braxton–Craig, what are the odds that Braxton will be henceforth known as "Old Nine-Toes?"

Graphic/Linnea Duvall

Solution to "The Oddball Egg"

Contributed by
Jeff Kinsey and David Corson-Knowles

Divide the eggs into 3 piles of 4 eggs each, called A, B, and C. Compare the weights of piles A and B.

CASE 1: If A = B, then you have 8 Standard Eggs and 4 Possible Odds. Now weigh 3 of the Standard Eggs against any 3 of the Possible Odds. If those 2 piles are equal, weigh the remaining egg (which you now know to be Odd) against a standard to determine if it is heavy (H) or light (L). If the piles are not equal, we know the weight of the oddball (either H or L) and we know there are only 3 possible choices. We now need to determine which of these three it is. Weigh any two from the 3 Possible Odds. If those two are equal, then the third is the oddball. If the oddball was determined to be H, it's the heavier one. If the oddball was determined to be L, it's the lighter one. If the two are not equal, using the weight we found after the second weighing (H or L), we know that for H the oddball is the heavier of the two, and for L the oddball is the lighter of the two.

CASE 2: If A is not equal to B, you have 4 Standard Eggs, 4 Possible Heavy (PH) Eggs and 4 Possible Light (PL) Eggs. Weigh 3 PH and 2 PL against 1 PH and the 4 Standard Eggs (setting aside 2 PL eggs). If 3 PH/2 PL is heavier, then the oddball must be one of the 3 PH. Compare any 2 of them. If 3 PH/2 PL is lighter, then the oddball may be one of the 2 PL. Compare them. If they are the same, then the oddball is the PH from the 1 PH/4 S side. If they are unequal, then the lighter one is the oddball. If 3 PH/2 PL = 1 PH/4 S, then weigh the 2 PLs you set aside. The lighter one is the oddball.

For the general solution, visit our website at http://www.yalescientific.org.