Genetic Distance Table

The percent chance of a common ancestor within a given time is not an exact science, thus the calculations vary as the genetic distance grows. For surname research, a genetic distance greater than 4 has limited value since surnames were not used much earlier than the 1600's.

Note: The above stats are based on the Grant DNA Project -- Grant surname relationships only.

		Percent Chance of a Common Ancestor in Genealogical Terms, Based on Alleles and Genetic Distance																	
Generations	Years	12/0	12/1	25/0	25/1	25/2	37/0	37/1	37/2	37/3	37/4	67/0	67/1	67/2	67/3	67/4	67/5	67/6	67/7
4	100	34	7	61	27	8	83	59-83	31-46	11-31	4-12	90	71	46	12-24	10	4	1-4	0-1
8	200	56	20	85	58	29	97	90-97	71-86	45-71	27-44	99	95	86	48-69	47-49	29-33	17-30	6-15
12	300	71	33	94	78	52	100	98	90-97	74-91	58-73	100	99	97	77-91	79-81	64-68	50-65	27-46
16	400	81	46	98	89	70	100	100	97-99	90-97	80-89	100	100	100	92-98	94	86-89	77-87	55-74
20	500	87	57	99	95	83	100	100	99	96-99	92-96	100	100	100	97-100	99	96-97	92-96	78-90
24	600	91	68	100	98	90	100	100	100	99-100	98-99	100	100	100	99-100	100	99	97-99	91-97

Excellent probability of a common ancestor in genealogy terms.
Fair probability of a common ancestor in genealogy terms.
Weak probability of a common ancestor in genealogy terms.
Statistically poor probability of a common ancestor in genealogy terms.

For the benefit of someone who does not understand genetic distance:

Scenerio 1: (1-12 mkr) If your results show that you have a perfect match for the first 12 markers (Alleles), then the results are considered 12/12, In the table above, the perfect match is reflected as 12/0 (or zero genetic distance in a 12-marker test). That suggests you have, for example, an 81% probability of common ancestor within the last 16 generations (400 years). Since surnames were just coming into use that far back, you will find connections to a lot of people with different surnames.

If, in the same test, your results show that you have a genetic distance of 1 (11/12), instead of zero (12/0), with one or more persons, your probability of a common ancestor drops to 46% in the past 16 generations and 68% in the past 24 generations.

Some participants may not find any Grant matches at 12/12, but will find a few at 11/12. Unless further testing is conducted, the participant will not know if the ancestry connection is strong or weak. We have a number of Grant participants who have a 11/12 match, and found from further testing that they have no Grant matches. From a family tree perspective, the 11/12 match is not very useful, but does show groups of participants who share a common ancestor somewhere in the distant past.

Scenerio 2: (13-25 mkr) If your results show that you have a perfect match for the 1-12 and the 13-25 marker tests, then the results are considered 25/25, In the table above, the perfect match is reflected as 25/0 (or zero genetic distance in a 25-marker test). That suggests you have, for example, an 85% probability of common ancestor within the last 8 generations (200 years) or . a 94% probability within the last 12 generations (300 years).

If, in the same test, your results show that you have a genetic distance of 2 (23/25), instead of zero (25/0), with one or more persons, your probability of a common ancestor drops to 52% in the past 12 generations and 70% in the past 16 generations. The probability of a common ancestor goes up as the number of generations approaches 20 and 24 generations.

Here again, unless further testing is conducted, the participant will not know if the ancestry connection is strong or weak.

Scenerio 3: (26-37 mkr) One should consider the 26-37 marker test to further refine the timeline and to see what branch from which on comes.

If your results show that you have a perfect match for the 1-12, 13-25, and the 26-37 marker tests, then the results are considered 37/37, In the table above, the perfect match is reflected as 37/0 (or zero genetic distance in a 37-marker test). That suggests you have, for example, an 83% probability of common ancestor within the last 4 generations (100 years) or . a 97% probability within the last 8 generations (200 years).

If, in the same test, your results show that you have a genetic distance of 2 (35/37), instead of zero (37/0), with one or more persons, your probability of a common ancestor drops to 71%-86% in the past 8 generations and 90-97% in the past 12 generations. The percentages become rather unstable as the genetic distance increases.

At this level of testing, it is not uncommon to have marker variances in the 13-25 and 26-37 marker results, and may cause the percentages to vary. You will also find that certain Alleles mutate more rapidly than others and are identified in red. These mutations suggest that the values have changed over time and differ from ancestors in the past. When groups of participants within a larger group have the same value for those mutated markers, it suggests a different branch of ancestors.

Scenerio 4: (38-67 mkr) Further testing will further refine the results..

If, when tested for the 38-67 markers, there is no change to the genetic distance from the previous tests, you will see from the results above, that there is a slight improvement in the percent chance of a common ancestor. You will note the percentages become rather poor if the genetic distance is greater than 4.