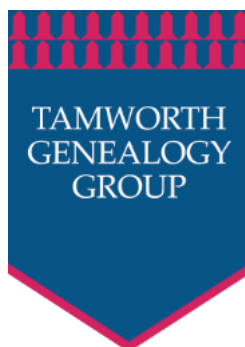


Tamworth Genealogy Group

DNA Testing How and Why





Tamworth Genealogy Group, are a group of like-minded family historians and genealogists who meet socially on a monthly basis to exchange information, ideas and assist each other with their research.

Anyone is welcome to join the group, whether you have a historic family connection with the area, live locally or are simply interested in family, social or building/house history. contact info@TamworthGenealogy.org.uk

THE GROUP DO NOT CARRY OUT RESEARCH PROJECTS FOR INDIVIDUALS, but are willing to assist those who are carrying out their own research into families who have connections to Tamworth and the surrounding villages.

We do NOT look for living persons. We only research into past generations.



[Tamworth Genealogy Group](#) is part of [The Holloway Society](#) and works closely with [Tamworth History Research Group](#) to uncover the rich history of the Tamworth area and the people who lived here. As such we are helping build [Tamworth Digital Archive](#) as a resource and publish in [Tamworth Heritage Magazine](#).

For more information contact info@TamworthGenealogy.org.uk

If you spot any errors in this document, or can offer suggestions, for this document please also [contact us](#)

In conjunction with Tamworth Heritage Magazine we can publish family histories, also community, club/team/society and business histories.

Contact either the Genealogy Group info@TamworthGenealogy.org.uk or the Editor of the Heritage Magazine Editor@TamworthHeritage/org.uk

DNA Testing How and Why

Version 1, September 2025 Initial edition.

The Basics

Chromosomes:

In humans, each cell normally contains 23 pairs of chromosomes, giving a total of 46.

One set of 23 inherited from the father, and the other set of 23 from the mother.

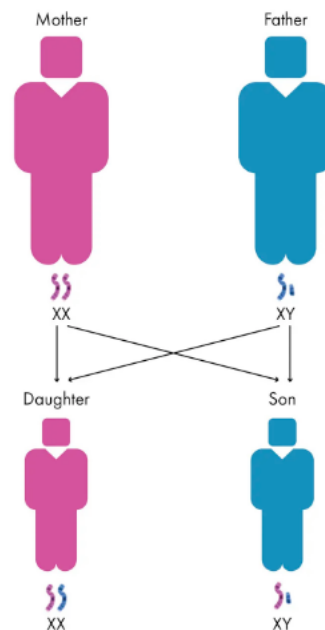
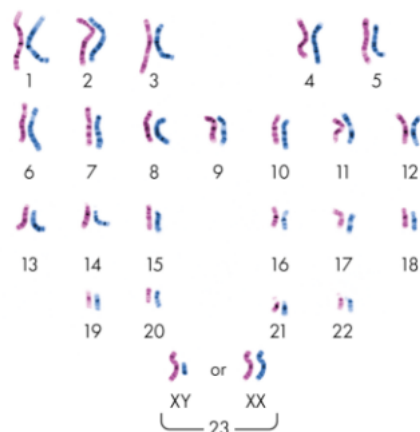
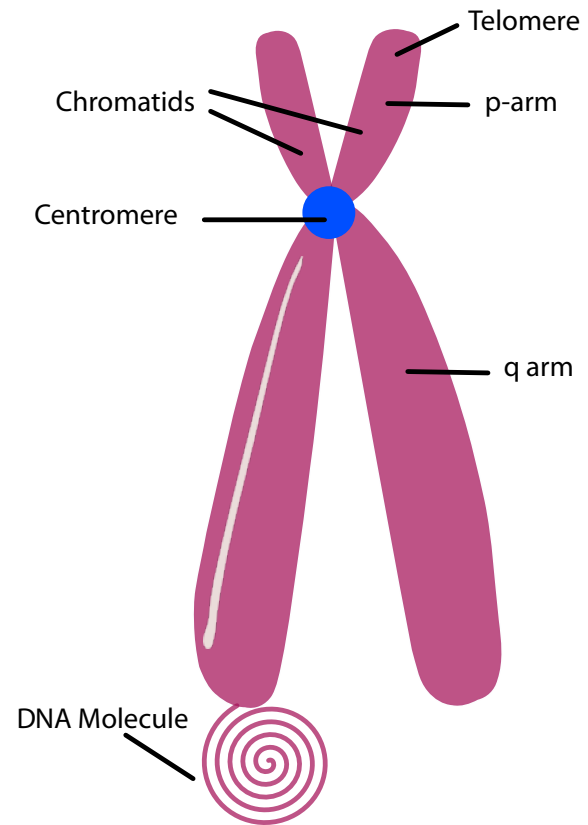
Twenty-two of these pairs, called autosomes, look the same in both males and females.

The 23rd pair, the sex chromosomes, differ between males and females.

Females have two copies of the X chromosome inheriting one from their mother and one from their father.

Males have one X and one Y chromosome (inheriting the x chromosome from their mother the Y chromosome from their father).

Thus Y chromosomes are only passed down the male line from father to son, down the line.



Centimorgans (known in short as cM):

- The total amount of DNA you share with someone is measured in centimorgans (cMs). The higher the number, the more closely you're related to the other person.
- Each individual inherits a random 50% of each of their parents' DNA. This will be a different random 50% to that inherited by any of your siblings (unless the sibling is an identical twin).
- Each of your parents in turn inherited a random 50% of their parents' DNA (meaning you inherit roughly 25% DNA from each grandparent, although this can vary depending on the make-up of the DNA you have inherited from each parent. Your first cousins (who share the same grandparents) will also have inherited roughly 25% DNA from your grandparents, but this will be a different mix to yours – some of it is highly likely to overlap with yours, and some of it will be slightly different.
- Based on the above, the Centimorgans charts show the general parameters for how many centimorgans an individual will likely share with their close relations.

DNA Test Results:

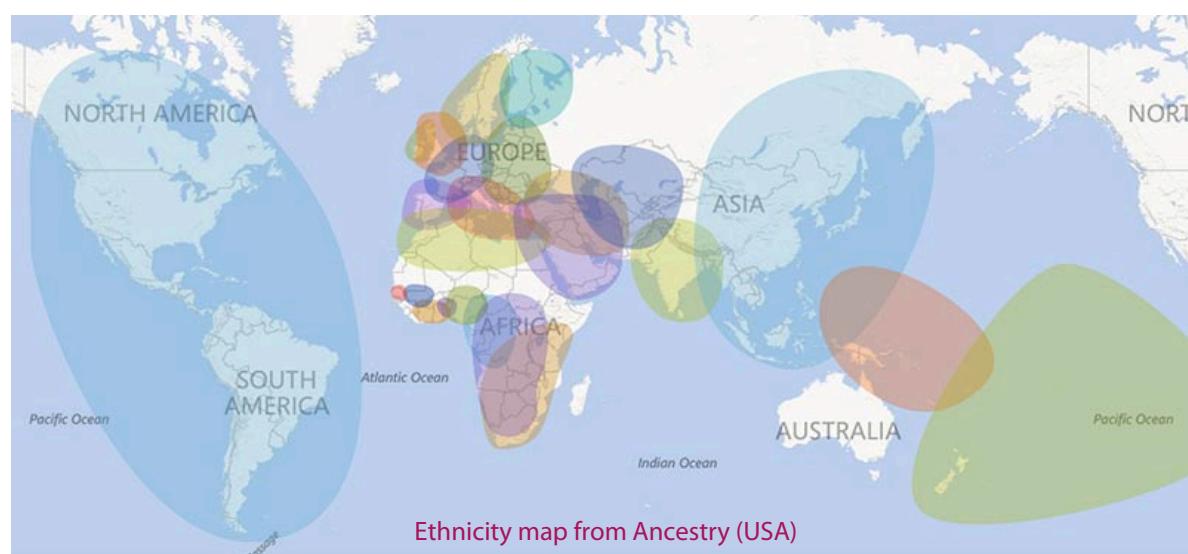
Your DNA test results will show two main elements: your estimated ethnic and geographical origins and a list of other test takers who share DNA with you, meaning they are related to you (or at least, those sharing a significant amount of DNA are – very small

amounts of shared cMs can indicate there are geographical links rather than necessarily a genetic relationship).

The main benefit of taking a DNA test for a family historian is to evaluate your DNA matches which can help you break down any brick walls (the Ethnicity results are not an exact science and are constantly being re-evaluated by each testing company and are more of a 'nice to have' than a specific tool, although they can still be helpful as a guide).

DNA Matches:

The different testing companies have different tools to help you evaluate your matches. For example, both Ancestry and MyHeritage have a colour coding system whereby you can group your matches together where they all share matches with each other, indicating they all descend from the same ancestral line. These are very helpful tools for making sense of your matches. FamilyTreeDNA can show separate X and Y chromosome matches depending on which of their tests you have taken (but they have a much smaller database compared to the main testing sites). Some sites offer a Chromosome Matching Tool for the more advanced researcher, which can give a greater insight into your matches.



March 2020

Blaine T. Bettinger
www.thegenecologist.com
 More about this project
 CC 4.0 Attribution License
 Interactive version by Jonny Peir at DNA Painter
 Click here to contribute data to the shared cM project
 Last updated 26th March 2020

Other versions

None with option to add a second amount
 None with colored probabilities
 With editable boxes
 Shared cM 3.0 (2017) version

How to read this chart

Relationship
 Average
 Range
 (low to high,
 90th percentile)



Enter the total number of cM for your match here:

reset

Or enter %

Then any relationships that fit will stand out below

Read more about cousin relationships

Half GG-Aunt / Uncle 208 103 – 284	Great-Grandparent 887 485 – 1486	GGGG Aunt / Uncle 51 0 – 154
Half 1C2R 125 16 – 269	Grandparent 1754 984 – 2462	GGG Aunt / Uncle 117 25 – 238
Half 2C1R 65 0 – 190	Parent 3485 2376 – 3720	Great-Great-Aunt / Uncle 420 186 – 713
Half 3C 48 0 – 168	Sibling 2613 1613 – 3488	Other Relationships
Half 1C1R 66 0 – 190	Half Sibling 1759 1160 – 2436	1C3R 117 25 – 238
Half 2C 120 10 – 325	Half Aunt / Uncle 871 492 – 1315	1C2R 36 0 – 166
Half 3C1R 37 0 – 139	Half 1C 443 156 – 979	1C1R 433 102 – 980
Half 2C1R 66 0 – 190	Half Niece / Nephew 871 492 – 1315	2C 229 41 – 592
Half 3C2R 27 0 – 78	Half Great-Niece / Nephew 431 184 – 568	3C 73 0 – 234
Half 1C3R 60 0 – 120	Half GG-Niece / Nephew 206 103 – 204	3C1R 48 0 – 192
Half 2C3R 48 0 – 144	Half Great-Niece / Nephew 850 330 – 1467	4C 35 0 – 139
Half 3C3R 13 0 – 42	Half GG-Niece / Nephew 887 485 – 1486	4C1R 28 0 – 126
Half 1C1R 65 0 – 190	Half Aunt / Uncle 871 492 – 1315	5C 25 0 – 117
Half 2C1R 66 0 – 190	Half Niece / Nephew 871 492 – 1315	6C 18 0 – 71
Half 3C1R 37 0 – 139	Half Great-Niece / Nephew 431 184 – 568	6C1R 15 0 – 56
Half 2C2R 48 0 – 144	Half Great-Niece / Nephew 850 330 – 1467	7C 14 0 – 57
Half 3C2R 27 0 – 78	Half GG-Niece / Nephew 887 485 – 1486	7C1R 12 0 – 50
Half 1C3R 60 0 – 120	Half GG-Niece / Nephew 206 103 – 204	8C 11 0 – 42
Half 2C3R 48 0 – 144	Half Great-Niece / Nephew 850 330 – 1467	8C1R 13 0 – 50
Half 3C3R 13 0 – 42	Half GG-Niece / Nephew 887 485 – 1486	9C 10 0 – 45

[Shared cM Project 2017 Update](#)

Table of Consanguinity

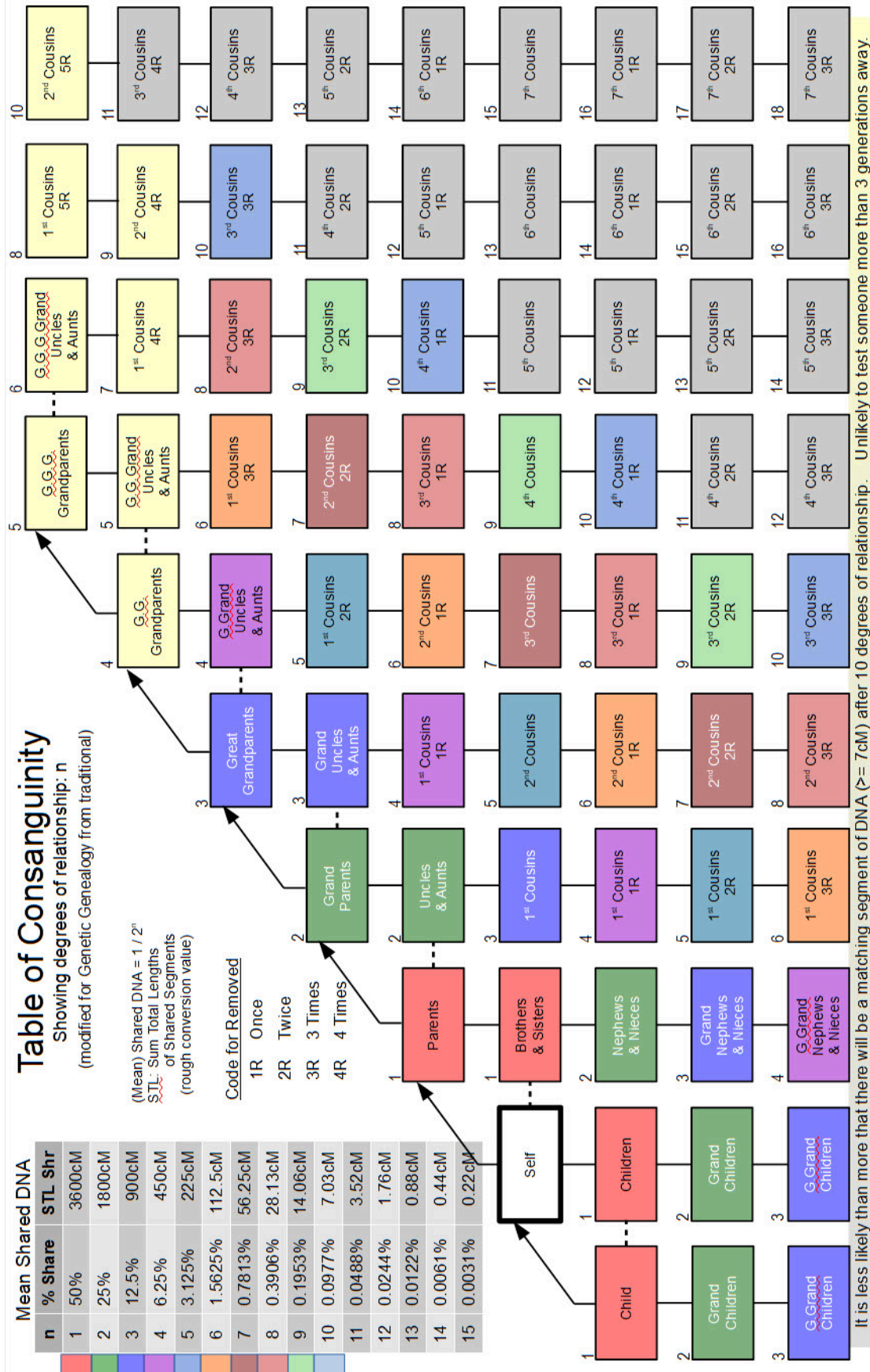
Showing degrees of relationship: n
(modified for Genetic Genealogy from traditional)

n	Mean Shared DNA	% Share	sTL Shr
1	3600cM	50%	3600cM
2	1800cM	25%	1800cM
3	900cM	12.5%	900cM
4	450cM	6.25%	450cM
5	225cM	3.125%	225cM
6	112.5cM	1.5625%	112.5cM
7	56.25cM	0.7813%	56.25cM
8	28.13cM	0.3906%	28.13cM
9	14.06cM	0.1953%	14.06cM
10	7.03cM	0.0977%	7.03cM
11	3.52cM	0.0488%	3.52cM
12	1.76cM	0.0244%	1.76cM
13	0.88cM	0.0122%	0.88cM
14	0.44cM	0.0061%	0.44cM
15	0.22cM	0.0031%	0.22cM

(Mean) Shared DNA = $1 / 2^n$
sTL: Sum Total Lengths of Shared Segments (rough conversion value)

Code for Removed

- 1R Once
- 2R Twice
- 3R 3 Times
- 4R 4 Times



It is less likely than more that there will be a matching segment of DNA (>= 7cM) after 10 degrees of relationship. Unlikely to test someone more than 3 generations away.

Adapted by The H600 Project from the original on Wikimedia, entitled "Table of Consanguinity showing degrees of relationship" by Sg647112c

The H600 Project <https://h600.org/wiki/Consanguinity>

Why Take a DNA test?

Taking a DNA test can open up a host of secrets that have been hidden by family members for generations. Once these secrets have been revealed it is difficult to un-see or unlearn what the test report tells you. Some of these secrets can be devastating. When taking a DNA test, you must be prepared for what the test may reveal about yourself and other family members.

One of our researchers was told by a surgeon in the 2020s that when looking for matches for kidney donation amongst the immediate family who volunteer that they find, across all types of families, around 20% of the time family members are not the direct family member they think they are. This is not something they will go on record with for obvious reasons. There are numerous reasons why a kidney from a direct family member may not be suitable so don't assume the worst if it happens to you.

In the case of adoptees or some birth parents it may be a question of privacy. They may not want to be identified or have contact. This can then lead to feelings of second abandonment or relinquishment. This is the reason that adoptees or birth parents should prepare themselves for these possibilities before testing and reaching out to DNA matches.

Another problem is that until post WW2 with the formation of the NHS and later computerisation, adoptions could be quite informal, especially with the loss of records in WW2. In fact the British comedian Larry Grayson (1920-1995) grew up not realising his "mother" was a actually friend of his biological mother who was still in the area. He knew his biological mother as "Aunt

Ethel". This sort of thing was not uncommon. Also an "older sister" can turn out to be the mother.

The other problem is the Roman Catholic Church had homes for unwed mothers where most of the babies were passed on to "good Catholic families", allegedly, sometimes telling the birth mother the child had died shortly after she gave birth. The paperwork was supposedly completed to give the recipient family the proper documentation for a birth rather than an adoption. The last such home closed in the 1990s in the UK/Ireland. [Click link](#) Though it is thought that these homes were not alone in this practice.

Therefore when you open the [Pandora's Box](#) of DNA testing you may not get the answers you were expecting but once opened they can't put it back in the box. So be prepared for surprises and be kind to those who made, *or had forced on them*, difficult choices in the past.

After taking a DNA test your testing company will provide you with a report together with a list of DNA matches. These matches are persons with whom you share DNA. DNA match lists show names and usernames for all your DNA matches. These are sometimes referred to as "cousin matches" and are the result of your DNA data being compared to other people's DNA data held by your testing company.

The matches are identified by matching segments of chromosomes which indicate a family relationship. How closely you match the other person depends on how many matching segments of DNA you have with

them. These are known as centimorgans or (cM). These are shown as a percentage. The higher the percentage the closer relationship you have with your match. Testing companies typically provide an estimated relationship range you may share with your DNA match.

1st cousin 1x removed
Paternal side
276 cM | 4% shared DNA

Examples of how Ancestry show estimated relationship ranges in their DNA match lists

- Shared DNA: 276 cM across 16 segments
- Unweighted shared DNA: 276 cM
- Longest segment 46 cM

Predicted relationships

We predict that these relationships are most likely. To predict relationships, we factor in self-reported ages and genders of both people.

- 2nd cousin
- Half 1st cousin 1x removed
- Half 2nd cousin
- 2nd cousin 1x removed
- 1st cousin 1x removed

Taking a DNA test can help you with breaking down “brickwalls” in your research. This may be by enabling you to find an unknown parent or grandparent. It could open up a whole new avenue of research. You may be able to confirm a relationship that you were unsure of. See the ONS “[Top Tips](#)” for guidance

Alternatively, you may be able to collaborate with a DNA match to solve your “brickwall” or by contacting them you could then discover what they know about their family lines. They may even have living memory of a person or persons which could assist you with your research.

Additional information which may be found in your DNA matches profile could include

family surnames, places of origin, even a family pedigree which includes names, dates and places.

The likelihood that you inherit any DNA from either one of a pair of Ancestors is as shown in the table

Some DNA companies allow you to upload your raw DNA, in the form of a GEDcom file, to their site. By doing this you can increase the number of DNA matches you have. Your DNA will be matched to the DNA for people who have tested with the other companies these may be your relatives that have not tested with your DNA testing company. This would enable you to maximise the information you obtain from your test results.

Generation removed	Likelihood of inherited DNA
1	100%
2	100%
3	100%
4	100%
5	100%
6	99.99%
7	99.5%
8	96%
9	84%
10	64%

Information taken from Ancestry DNA

Your DNA report will also provide you with an ethnicity report. Ethnicity cannot be detected by DNA but the report is a reflection of shared ancestry based on social and cultural practices.

Ethnic groups may be linked by religion, linguistic heritage or merely a common ancestral origin. These may sometimes overlap with a person’s genetic ancestry and *are constantly changing* as DNA providers grow their databases and re-analyse the data.

Types of DNA Test and Who can Take Them

Y-DNA tests

Genetically born males inherit one Y chromosome from their fathers and one X chromosome from their mothers. Y-chromosomes are passed from father to son more or less unchanged, thus males can trace their patrilineal (male-line) ancestry by testing their Y-chromosome.

This test can reach much further back in time than an autosomal test; it only tests one line of your tree, this is the surname line so can be useful for surname studies and possibly provide a surname clue for males with unknown male ancestors on their direct paternal lines.

Genetically born females don't inherit a Y-chromosome, so they can't take Y-DNA tests (although their brother, father, paternal uncle, or paternal grandfather could).

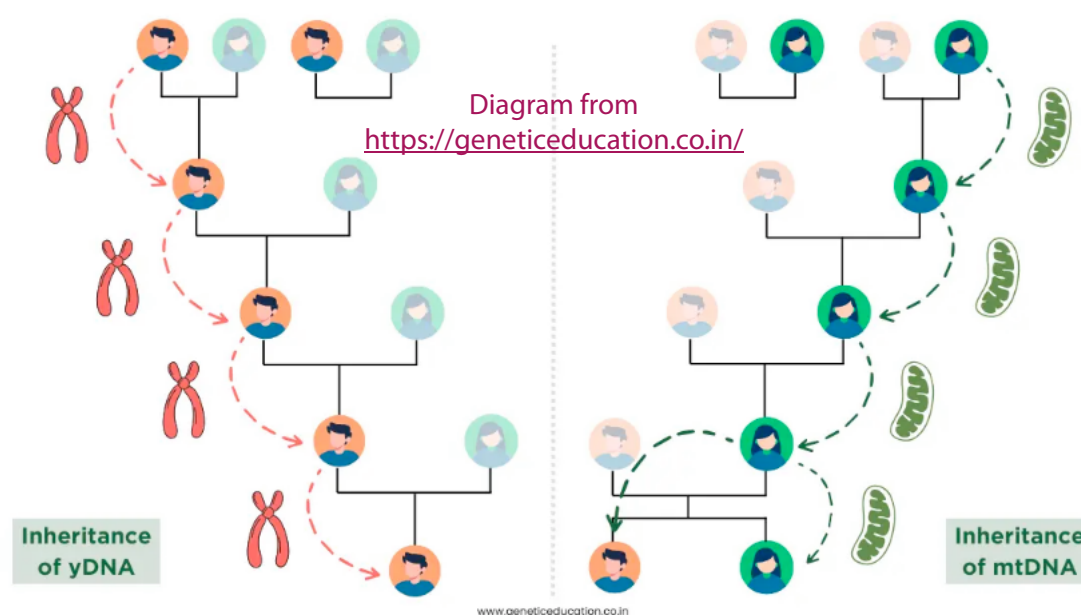
Y-chromosome tests uncover a person's Y-chromosome haplogroup, this being the ancient group of people from whom your patrilineage descends. Because only your

male-line's direct ancestors are traced by Y-DNA testing, females (nor their male ancestral line) from whom a male descends can be traced using a Y-DNA test.

mtDNA tests (Mitochondrial DNA)

Genetically born females inherit one X chromosome from their mothers and one X chromosome from their fathers (their fathers having inherited the X chromosome from their mothers). Mitochondrial DNA tests trace your matrilineal (mother-line) ancestry by testing their mitochondria, which are passed from mothers to their children. Everyone has mitochondria therefore people of all genders can take mtDNA tests.

Mitochondrial DNA tests uncover a person's mtDNA haplogroup, these are the ancient group of people from whom your matrilineage descends. Because mitochondria are passed on only by women, no men (nor their ancestors) from whom you descend can be traced using an mtDNA testing.



Autosomal DNA

An autosomal DNA test measures your autosomal chromosomes, which is the makeup of the majority of your DNA. These chromosomes are inherited from all of your ancestral lines (50% from each of your biological parents).

Autosomal DNA tests have the ability to analyse your DNA from more of your ancestors than other types of DNA tests. They can determine ancestral origins and close genetic relationships back to the past 5-7 generations to a high level of accuracy. The X-chromosome DNA is included with this test: it is the best test for identifying unknown ancestors and solving mysteries

Both males and females can take an Autosomal DNA test to determine their close and wider family connections. Autosomal tests analyse all chromosomes except the sex chromosome, providing information about shared DNA with relatives across multiple generations.

An Autosomal test will not reveal a halogroup. Haplogroups are determined through specific DNA tests which focus on the Y chromosome or the mitochondrial DNA.

Autosomal DNA chart from the [Pritchett - Prickett DNA Project](#)

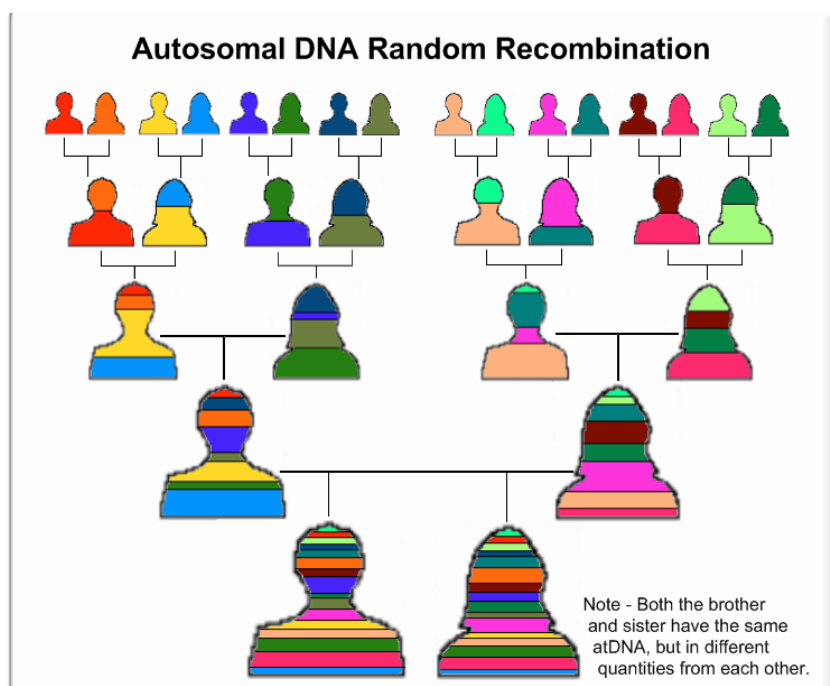
AUTOSOMAL tests

You can use Autosomal DNA testing to help with the following:-

- Verifying your tree
- Breaking down brick walls
- Adding new branches to your tree
- Identifying unknown ancestors
- Connect with new cousins
- Test hypotheses
- View your relationship to other matches
- Learn about the make-up of your ethnicity
- This test includes X-chromosome DNA

If you are thinking of taking an Autosomal DNA test for family history purposes it is commonly advised to choose an Ancestry DNA test. This is because Ancestry has the largest DNA database of all of the companies offering DNA testing. Once you have your DNA data results from Ancestry it is then possible to download your raw DNA data in a GEDCOM file which can then be uploaded to other DNA family history sites to obtain more DNA matches.

Ancestry does not offer Y-DNA or mtDNA tests and does not allow you to upload raw DNA data from other DNA testing companies to their database



Where can you test?

AncestryDNA: This is an autosomal test but Ancestry has by far the largest autosomal database with over 20 million testers and growing. They do not allow uploads of raw DNA data from other testing companies. Ancestry should be the first port of call for anyone wishing to take a DNA test if they have a mystery to solve or if they just want to take their first tentative steps into their DNA. They also have a colour coding system which allows you to sort your DNA into Paternal or Maternal matches and further colour code these into your various ancestral lines <https://www.ancestry.co.uk>



MyHeritage: This test is an autosomal test (with optional health reports) and has a fast-growing database of over 4 million testers. MyHeritage boasts some of the best tools available to the tester; They also allow the transfer of raw DNA data from elsewhere for free but there is a small charge (£35) to unlock features such as essential shared match lists and tools like the chromosome browser. MyHeritage also have a colour coding system similar to that on Ancestry to assist you in breaking down the lineage of any shared matches. <https://www.myheritage.com/>



Family Tree DNA: Is the only company to offer Y-DNA and MtDNA databases as well as an autosomal one. Their autosomal database is much smaller than those of the other big testing companies. You can upload your Ancestry raw data in the form of a GEDcom file – for a small fee of \$19 you can get access to advanced tools such as the chromosome browser and features such as the MyOrigins ethnicity estimate to assist you in making sense of your DNA results. <https://www.familytreedna.com/>



LivingDNA: Is in partnership with FindMyPast and offers detailed UK & Ireland regional ethnicity estimates. They launched a matching database in autumn 2018 but the pool is still extremely small. They do allow raw data transfers from other sites, though, and it's worth doing this just in case you are one of the lucky ones with good matches in the database. <https://livingdna.com/uk/>



Testing Company	Ethnicity Report Name	Match List Name	Allows Uploads From Other Companies	Database*
Ancestry	"Ethnicity Estimate"	"DNA Matches"	No	27 Million
MyHeritage	"Ethnicity Estimate"	"DNA Matches"	Yes	9.1 Million
Family Tree DNA	"MyOrigins"	"Family Finder Matches"	Yes	2 Million
Living DNA	"Ancestry"	"DNA Relatives"	Yes	300,000

* Figures available at the time of writing in 2025

When reaching out to DNA matches to find your wider family you may want to consider some things before contacting them.

1. Your DNA match may have taken the test for fun and may never log onto the website again.
2. Your DNA match may not know how to help you determine your family connections and may also not have prepared a family tree.
3. In the case of a birth and a subsequent adoption. This may have been kept a secret from the wider birth parents family.
4. A birth family may not wish to be contacted.
5. Birth family members may wish to remain unidentified.

These and many other things need to be considered before making contact with a DNA match.

Contact is usually made by using the testing company's website messaging system. When attempting to make initial contact always give the name of the DNA match you are looking for information on. The person you are messaging may manage a number of DNA kits so giving the name of the match will allow them to identify the specific test you are interested in within their records. You should also give them the name of the testing kit you manage and that they match to. This will allow them to confirm your request is not SPAM.

Suggested wording for making first contact

Hi,

The test you administer for "**X**" is a close match to (*name of your DNA kit*)
Could you please share some information about **X's** family tree so I can determine the relationship?

I'm also wondering if you've uploaded your results to GEDmatch or any other testing company database? Would you be willing to upload them?. It is free to upload your raw data GEDcom file to these databases.

Please email me back and let me know if you received this message. Some testing company messaging services do not always deliver messages or they can be delayed. I would really appreciate an email so I know my message got through (and so you know I received your reply!)

Thanks,
Your name
Your e-mail address

Top Tips for the First Time Tester

Set out your reasons for taking the test.

This will help you decide which test or tests would be best to take. Yes, there is more than one type of DNA test and they do different things, as you will see in the following pages!

An autosomal test on Ancestry is usually the best first DNA test for most people.

“Usually” for *“most”* people. See the first point and understand this test may not give you all the answers and you may need additional tests but it is usually the place to start.

Build out your tree as far, wide and deep as you possibly can whilst awaiting your test results.

The results may not be what you expect so work on your family tree.

Take time to learn how to use your new testing site and what it can offer you when you receive your results.

The various test sites offer a range of services and add-ons. Some may be useful and others not, depending on what you are trying to achieve and the answers you get.



Tamworth Genealogy Group

DNA Testing

How and Why



www.TamworthGenealogy.org.uk