
Understanding Relationships: Part One - What's a 3c2r?

Traditional Family History Relationship vs DNA relationships

Using DNA to discover family connections means that you will spend a lot of time working out exactly what the relationship might be between yourself and other DNA matches.

There are two aspects to comparing traditional relationships with predicted DNA relationships:

You may have a known relative who has tested:

- What does your family tree show as the relationship between the two people?
- Does the relationship correspond with the amount of DNA that these two people share?

Or, you may have an unknown person as a match that you are trying to slot into your family tree:

- Based on the amount of DNA you share, what sort of relationship might the two of you have?
- How and where does this person fit within your tree?

Any variation between the two elements may bring surprises, for example:

- Your sister is intrigued by your DNA results so also takes a DNA test. The amount of DNA you share indicates that you are half-sisters, so you only have one parent in common. Which parent do you share? Which of you has a mystery parent? Does anyone else in the family know about this? Who is the mystery parent?
- Your results arrive and there is first cousin listed. You have no idea who this person is – as far as you knew neither of your parents had any brothers or sisters. Did one of your grandparents have another child that no-one knew about?

This information sheet concentrates on finding the correct terminology for relationships within family trees and why this is necessary – part two will concentrate more on the amounts of DNA these relationships would be expected to share and how to go about working out where unknown DNA matches might belong within your tree.

Close Relationships

Close family relationships are part of our everyday language – Mother, Father, Uncle, Aunt, Grandmother, Grandfather, Son, Daughter, Grandchild, Niece, Nephew. Some of these relationships do not mean that you are biologically related to that person – my husband's sister's son is my Nephew, but we are related by marriage, not DNA. Some of these definitions also get used as terms of affection, rather than an accurate description of the relationship. "Aunty" Mabel might actually just be a friend of your Mother's, or perhaps her cousin, not actually her sister.

New terminology is still being developed – "Nibling" was a new description to me, one word to cover both niece and nephew (similar to sibling instead of brother or sister).



Full or Half relationships – does it really matter?

As time goes by families evolve, and the list of close relationships expands. People may marry several times, or have relationships and children with more than one person. Within a household there may be children who are biologically related through one parent but not the other (whether they are aware of it or not), or not biologically related to each other at all. Children may be adopted by other families, or adopted within the same family. Depending upon the era you are researching, adoptions may be formal and well-recorded (but you may not be able to access the documents), or they may have been much less formal arrangement.

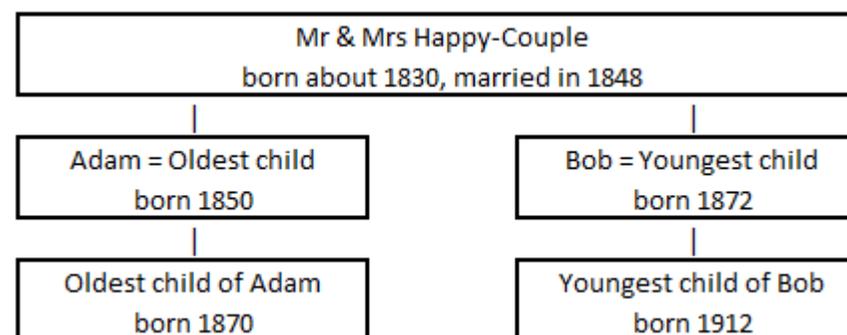
The precise relationship may not matter whatsoever within the family itself, but, if you are dealing with DNA results, the difference between full and half relatives will be reflected in the amount of shared DNA, especially within close family relationships. If half-siblings exist within a family then the amount of DNA shared by their descendants will also be less than if they were full siblings – for example, your Mother's sister would be your Aunt, but if your Mother and Aunt had different Fathers, the correct description would be half-Aunt and her children would be your half-cousins rather than first cousins.

DNA testing can bring many surprises, some welcome, some not so welcome. Discovering that your brother is in fact your half-brother means that one of you has an unknown parent, which could be a huge shock. You could make similar discoveries about cousins, Aunts, Uncles or even your Grandparents by comparing the amount of DNA you share with them against the anticipated amount. A term you may come across in these situations is **NPE** – there are various definitions for this abbreviation, including **Not Parent Expected** or **Non Parental Event**. Dealing with discoveries like this can be very difficult, so it is important to be as well-informed as possible and consider all the possibilities.

Age differences

If you are trying to establish how two people are related, knowing their ages can help you determine the relationship between them – but it can also be misleading. DNA will offer you a range of different possible relationships that are appropriate for the amount of DNA you share. Some relationships are fairly easy to rule out - if you have someone who is only ten years older than you, then there is no way that they are going to be your Grandmother.

However, if you have two people who are similar in age it does not necessarily prove that they will be of the same generation. This is especially true if you are looking at a point in history when it was common for families to have a dozen children over twenty years. This diagram is a deliberately extreme example, but shows how large families can result in unexpected age differences:



- A couple could easily end up with a grandchild who was older than some of their children
- An Uncle could be younger than their niece/nephew

Going back through the generations

As your family tree goes further back in time and more generations are added, so you gain an increasing number of direct-line ancestors.

These ancestors are the people who have passed **some** of their DNA down to their children, who will then have passed **some** of the DNA they were given by their parents on to **some** of their children and so on, until **some** of the DNA may still be detectable in **some** of their modern-day descendants. The word "**some**" appears many time in that sentence, but for a good reason! You will definitely have DNA in common with close biological family members – parents, grandparents, siblings, first cousins etc, but you will **not** have DNA in common with every single one of your distant ancestors. This makes it sound as though you are not likely to find many DNA connections to help you research beyond family you may already know! However, your distant ancestors will have many descendants who are living today – every one of your pairs of 3G-Grandparents is likely to have had many children, who will probably have all had many children of their own - by the time you are looking at the generation of living descendants there are a vast number of potential connections to be made. Even if you don't match all of the living descendants you will hopefully share some DNA with enough of them to establish which ancestors you have in common.

Autosomal testing can show you connections to people who have direct-line ancestors in common with you going back about 5 – 8 generations. These ancestors are known as your **Most Recent Common Ancestor (MRCA)** – eg, you and a first cousin would both have the same Grandparents.

To give you some idea how many possibilities for connections with common ancestors this involves:

You	There is only one of you – unless you are an identical twin!
Parents	2 Parents
Grandparents	4 Grandparents
Great-Grandparents	8 Great-Grandparents
2G-Grandparents	16 Great-Great-Grandparents
3G-Grandparents	32 Great-Great-Great-Grandparents
4G-Grandparents	64 Great-Great-Great-Great-Grandparents
5G-Grandparents	128 Great-Great-Great-Great-Great-Grandparents

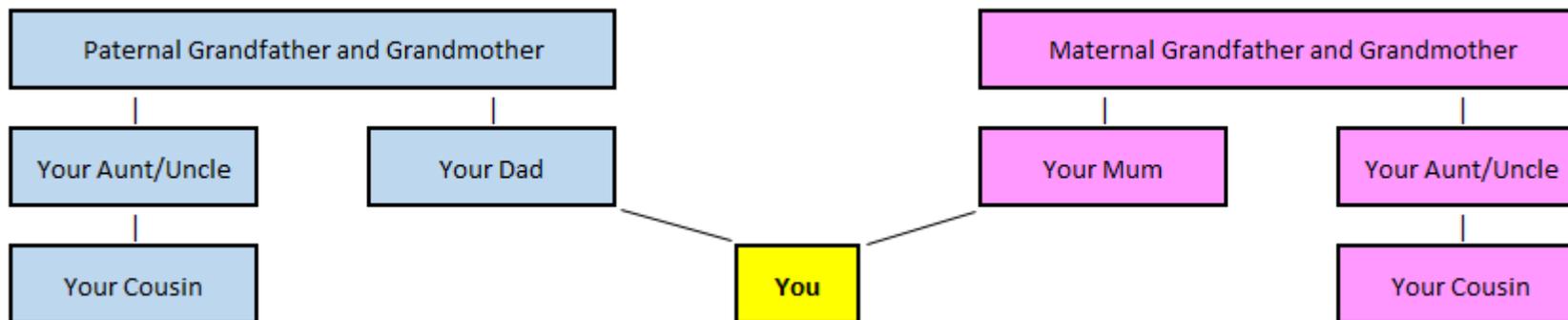
If you think you are connected to a DNA match via 3G-Grandparents, then you also need to work out which of the 16 couples are the ones that connect you!

Cousins

As you go back through the generations and find relatives you share ancestors with, you will find different types of cousin. Whilst each new generation of Grandparents is indicated by adding another "Great", more distant cousins are measured with numbers – third cousins, fifth cousins etc.

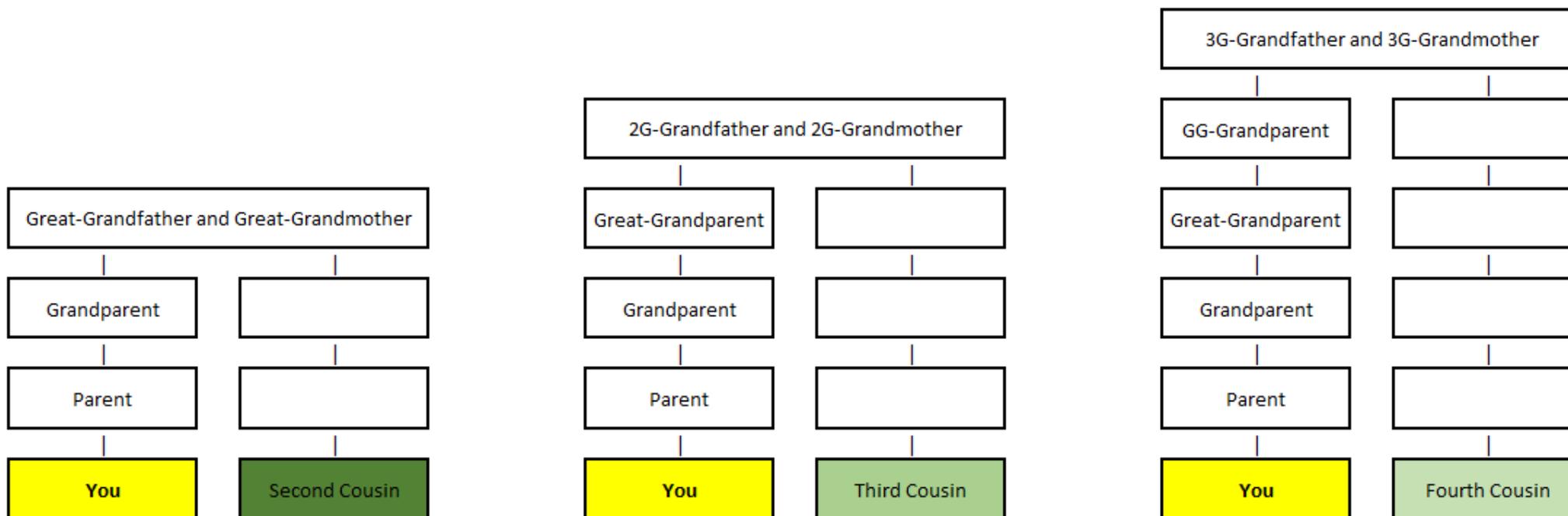
The simplest cousin relationship is that of first cousin – the children of your Aunts/Uncles. You and your first cousins will have a set of Grandparents in common – but you have two sets of Grandparents. If DNA shows you a mystery first cousin it will take further investigation to establish which set of Grandparents are the ones to connect you and your new family member.

A point to remember is that just because two people are related to you ***it does not necessarily mean that they are related to each other***. Assuming that your Mother's family and Father's family are not inter-related, then your maternal and paternal cousins will have no DNA connection between them:



First cousins share a set of Grandparents, as shown in the diagram above.

Second cousins have a pair of Great-Grandparents in common, **third cousins** have a pair of Great-Great-Grandparents in common and so on:

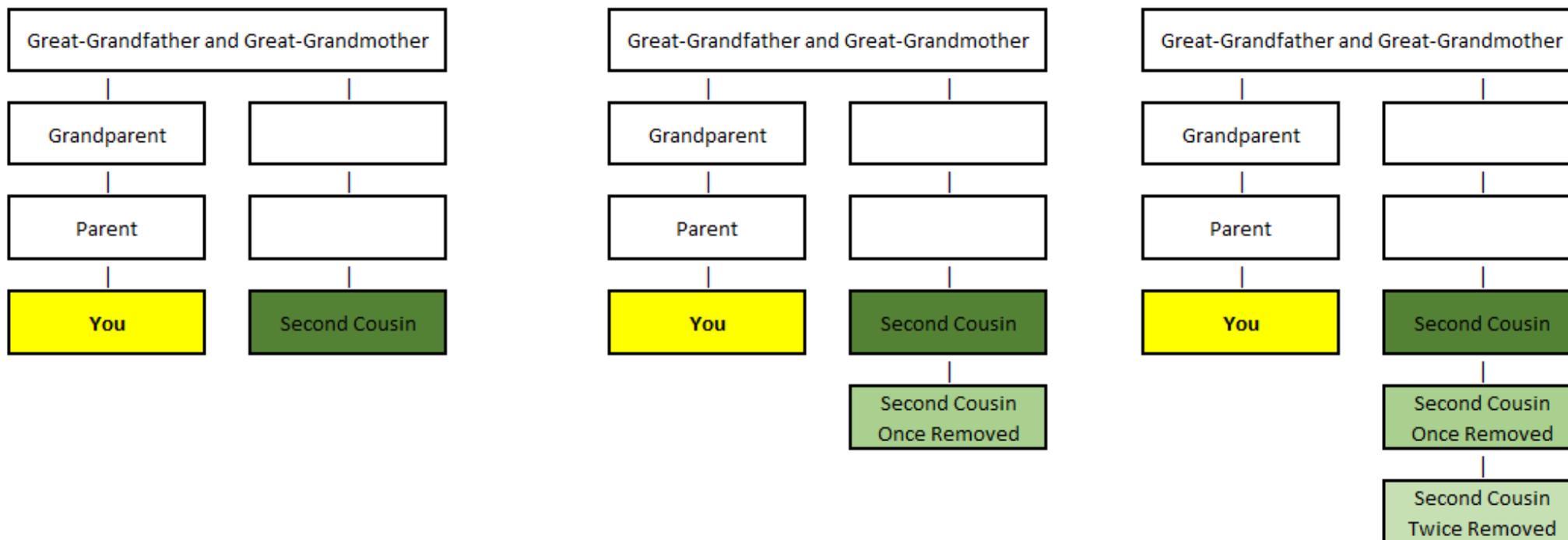


"Removed" Relationships



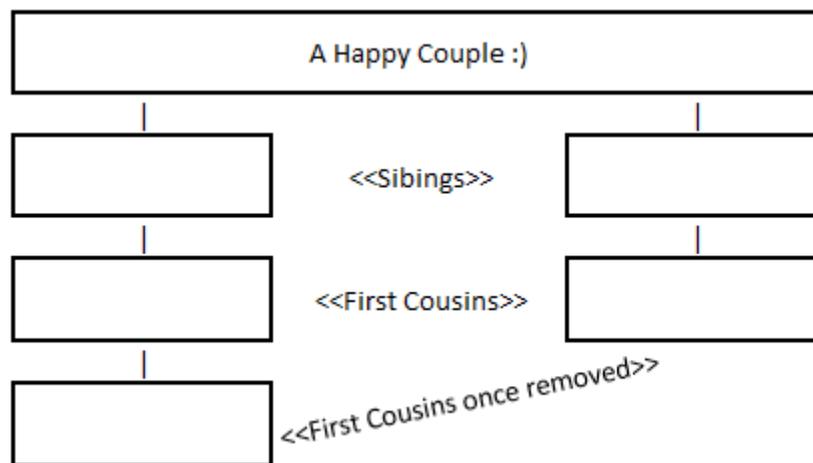
All the cousin relationships illustrated on the previous page are beautifully "balanced", like a set of scales – there are the same number of generations descending from the common ancestor to you AND your cousin.

There are, of course, many other possible relationships that do not look quite so well-balanced! When there are more generations on one side of the diagram than the other, the term "removed" is used. For every generation that is added, so you add another number to the "removed" – once removed, twice removed etc.

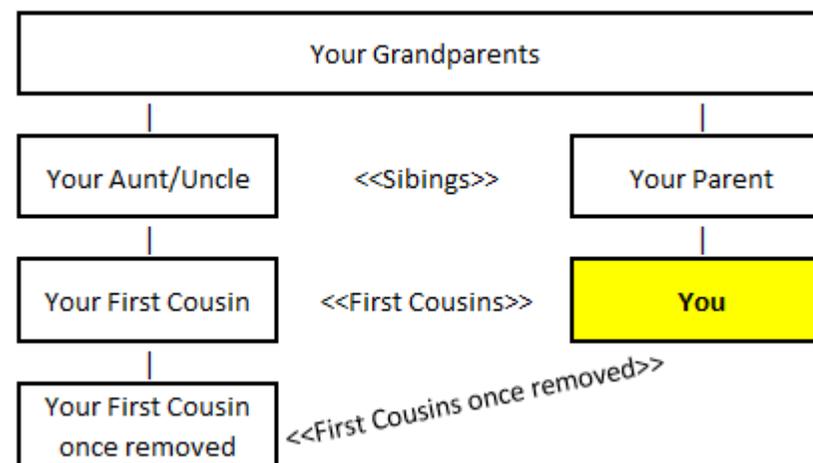
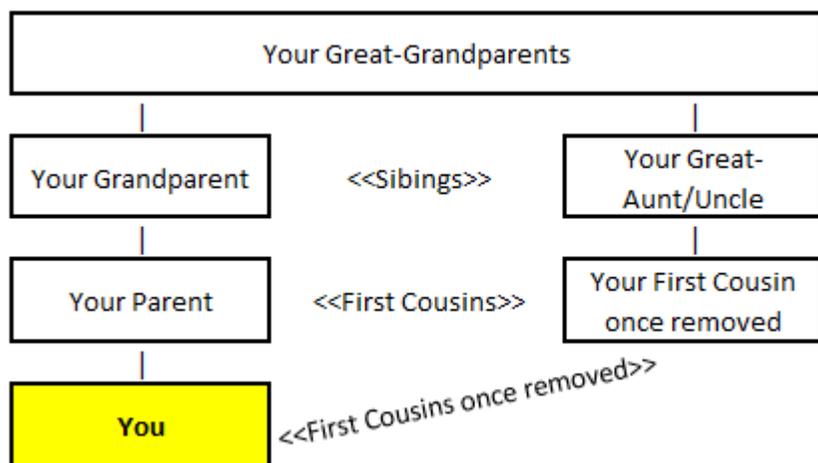


Once you combine all the relationships that have been mentioned so far, you can see that the descriptions can get very long-winded! Being someone's half-third cousin twice removed may be accurate, but you will not be alone if you need to draw a diagram and count on your fingers to understand what it means!

Even after you have worked out what might be a plausible relationship to an unknown DNA match, there are still further possibilities... For example, if testing indicated that you could be related to an unknown person as a first cousin once removed, the relationship would look like this:



But which box do you belong in, and which one does your match belong in? There are two ways this relationship could work:



It still leaves the possibility that you are related via **your** Great-Grandparents OR it could be **your** Grandparents...

For further help discovering your DNA family, [visit the website](#)  or  [Find us on Facebook](#)