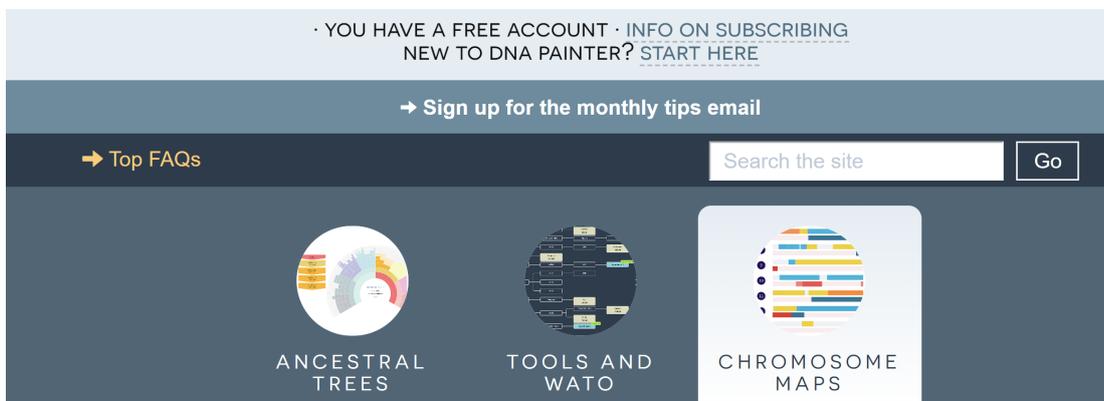




Handout for Chromosome Maps on DNA Painter

1. Make sure your family tree of at least your direct ancestors (parents, grandparents, great grandparents etc.) is as complete as you can make it and have it in front of you (printing out is handy). You can open a free Ancestry account and set up a completely private tree if that's what you want. You can also do a tree on DNA Painter.
2. Go to dnainter.com and register for a free account.
3. Open your GEDmatch account – if you don't have one, register for free and upload your Ancestry DNA results to it. Encourage as many of your family and close DNA matches to do the same.
4. Open a free account at My Heritage and upload your Ancestry DNA results to it – again, encourage family and close DNA matches to do the same.
5. A couple of days after the above steps have been completed, you should be ready to create a chromosome map on DNA Painter. Go to 'Chromosome Maps' on DNA Painter and watch the 'How to' video.
6. Create a new chromosome map on DNA Painter and the window below will open:



CHROMOSOME MAPS

Chromosome mapping is the process of mapping segments of DNA to specific ancestors. For more information, please watch one or both of the videos below and further down this page.

You can also use the [Cluster Auto Painter](#) to map groups of interrelated matches automatically.

Name **Segments** **Created** **Updated**

Click the 'X' on the right to delete a chromosome map

[Create a new map](#) [More info](#)

CREATE A NEW CHROMOSOME MAPPING PROFILE

A new chromosome map is a set of blank chromosomes that represent an individual who has taken an autosomal DNA test.

When you have a DNA match, you will match on particular segments. The aim of this site is to provide a platform that lets you take this match segment data and use it to 'paint' your chromosomes (or those of the person who took the DNA test!), adding as much information as possible so that you can use this info to help trace future matches.

Chr	Start Location	End Location	Centimorgans (cM)	SNPs
1	196,237,903	205,320,110	13.2	1,552
2	174,754,040	216,953,303	35.6	4,706
21	33,978,117	40,213,125	12.9	1,268

Matches: [Trotter-Pugh T123456](#)

You can choose whichever colours you like. For known connections, it can be a good idea to assign a distinct colour to each of the four grandparents, and then use variations of these. For more information on how to set up a chromosome map, click the Settings cog at the top left and then click on 'Tour of this page'.

Who is this map for?
Please enter a name for this chromosome map - the test-taker whose chromosomes you'd like to paint

Is this person male or female?

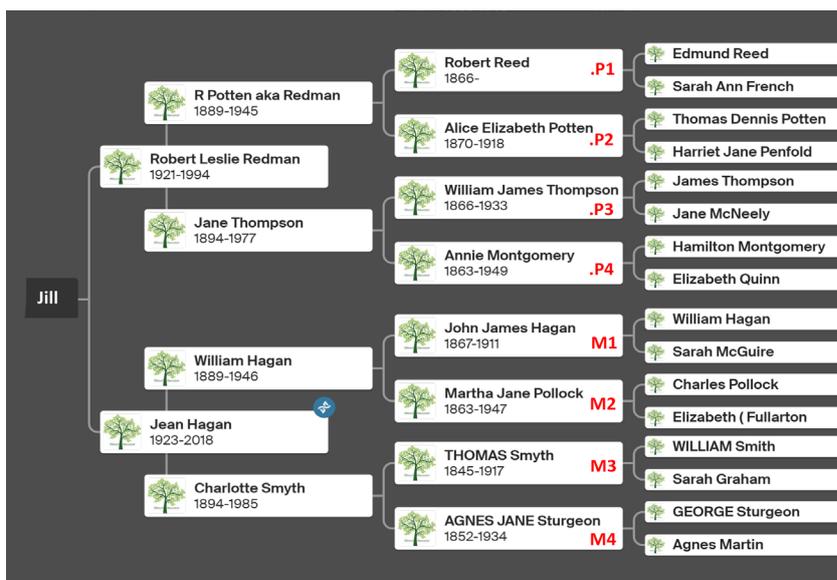
[SAVE AND START PAINTING](#)

7. Read the info in the window above and then enter your name and gender in the boxes – my example will be for a female named Jill.

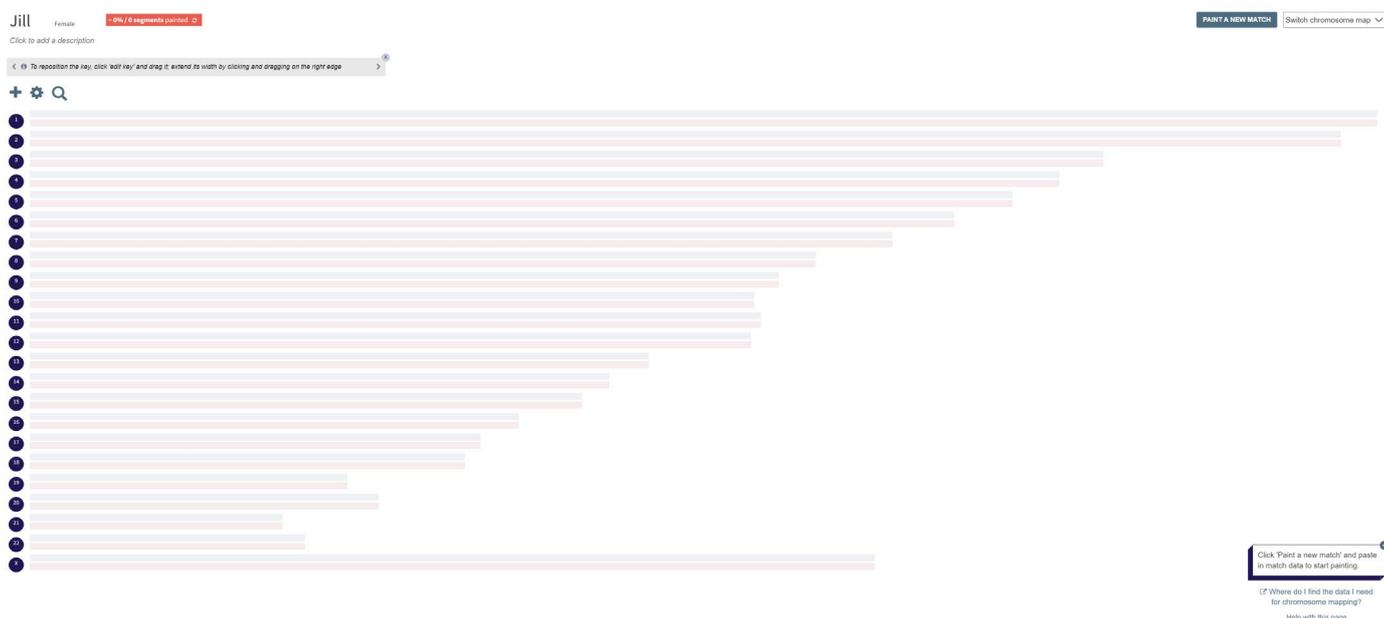
8. I suggest that you use similar colours for each of your 8 great grandparent lines as we did when we did the Ancestry DNA colour groupings:



This is Jill's tree, showing the names for each of these ancestral lines:



9. In the window shown in point 6, click on 'SAVE AND START PAINTING' and you will get a screen like this below, with all 22 chromosomes, plus the X chromosome (and the Y chromosome if you happen to be male), each showing a pale blue and pale pink line, one for the segments inherited from your father (pale blue line) and the other for the segments inherited from your mother (pale pink line). No segments from your matches are as yet painted – this is the blank map ready for you to start. The red bit at the top shows you how many segments you have mapped as you go through the process of mapping each of your known matches.



- Unfortunately, Ancestry does not give you segment data for your matches – so that’s why we download our Ancestry DNA results and then upload them to GEDmatch and to My Heritage, as they do provide this data. Firstly, go to your GEDmatch account and open your GEDmatch ‘One to Many’ free tool. This will show you all your DNA matches on GEDmatch. Hopefully you will know who a number of these people are, and how they match you. Write down or take a screen shot or photo on your phone so that you have your own kit number handy and the Kit numbers of the best of these matches. The Kit numbers are important as you will use them to get the segment data for your chromosome map.
- It’s best not to include a parent or sibling in your map as they will be descended from too many of your great grandparent lines – cousins are more useful!
- These are the first of Jill’s matches and she knows who 7 of them are – but she will ignore the top two who are her mother Jean and her sister Helen:

Select	Match No.	Kit	Name (* => alias)	Email	GED WikiTree	Age(days)	Type	Sex	Mt	Y	Total cM	Largest	Gen	Total cM	Largest	Source
<input type="checkbox"/>	1	HE6783289	Jean			342	2	F			3572	151.8	1.00	172.4	89.8	Ancestry
<input type="checkbox"/>	2	A698271	Helen		GED	2365	2	F			2517.8	97.3	1.26	187.8	105.1	Migration - F2 - A
<input type="checkbox"/>	3	DN6170708	Val			342	2	F			501.2	63.5	2.42	0	0	-
<input type="checkbox"/>	4	A413685	E G			1644	2	M			346.4	34.9	2.69	0	0	Migration - F2 - A
<input type="checkbox"/>	5	FJ8940631	Alma			812	2	F			69.3	25.2	3.85	0	0	Ancestry
<input type="checkbox"/>	6	A534957	Diane			2279	2	F			48	48	4.11	0	0	Migration - F2 - A
<input type="checkbox"/>	7	QV9586854	Joy			490	2	F	T1a1		44.3	24.9	4.17	0	0	23andMe
<input type="checkbox"/>	8	H319648	Robert			1843	2	M			43	34	4.19	0	0	Migration - F2 - H
<input type="checkbox"/>	9	UD2362275	Carol			484	2	F	T1a1		42.7	23.3	4.20	0	0	Ancestry
<input type="checkbox"/>	10	HH5760914	Roger			1385	2	M	H6a1a	R-P311	41	18.7	4.23	0	0	23andMe
<input type="checkbox"/>	11	FG7952845	Michael			232	2	M			40.2	24.8	4.24	0	0	23andMe
<input type="checkbox"/>	12	AL1617763	eac			730	2	F			40	13.9	4.24	0	0	Ancestry
<input type="checkbox"/>	13	ED7068630	Trisha			20	2	F			39.8	39.8	4.25	0	0	FTDNA
<input type="checkbox"/>	14	BC771101C1	Linda		GED	265	258	F			38.6	17.4	4.27	0	0	Combined
<input type="checkbox"/>	15	T262568	Joan			2064	2	F	T2		36.3	28.9	4.31	0	0	Migration - F2 - T
<input type="checkbox"/>	16	A822081	marg			1971	2	F			36.3	28.9	4.31	0	0	Migration - F2 - A
<input type="checkbox"/>	17	A145934	EC			1773	2	F			36.2	18.5	4.32	0	0	Migration - F2 - A
<input type="checkbox"/>	18	MV4357890	Geo			292	2	M		I-Z74	35.4	10.8	4.33	0	0	23andMe
<input type="checkbox"/>	19	EC1134525	MAM			550	2	F			35.3	26.3	4.33	0	0	Ancestry

- Jill will now go to One to One Autosomal DNA Comparison tool on GEDmatch - under ‘Free Tools’ tab:

GEDmatch One-to-one Autosomal DNA Comparison Entry Form

Useful YouTube video on using the One to One DNA comparison tool. [WATCH VIDEO](#)

This utility allows you to make detailed comparisons between Autosomal DNA kits. Results may be based on either default dynamically determined thresholds, or thresholds that you provide.

Kit Number 1:

Kit Number 2:

Show graphic bar/numeric positions for each Chromosome?

Graphics and Positions
 Position Only
 Graphic Only

Display Only Chromosomes with Matched Segments

LX1554103 is her Kit number. What she now wants to do is to compare her Kit number with each of the Kit numbers of her DNA matches that she knows on GEDmatch. She will start with Val, who is her half first cousin.

14. Jill knows that Val is connected to her through her Great Grandparents John James Hagan (M1) and Martha Jane Pollock (M2), so she will use a yellow/orange colour for this line. Jill puts Val's kit number into the One to One Autosomal DNA Comparison tool, making sure that she has clicked on 'Position Only' as shown at the bottom of the previous page. She then clicks on 'Compare' at the bottom of the form and the following is the result:



Individual marker indications:

Base Pairs with Full Match	
Base Pairs with Half Match	
Match with Phased data	
Base Pairs with No Match	

Validity of segments:

SNP Density 0 to 0.5. Darker blue means higher density.	
Large gap between adjacent SNPs	
No Match	

Comparing Kit LX1554103 (Jill) [Ancestry] and Kit DN6170708 (Val)

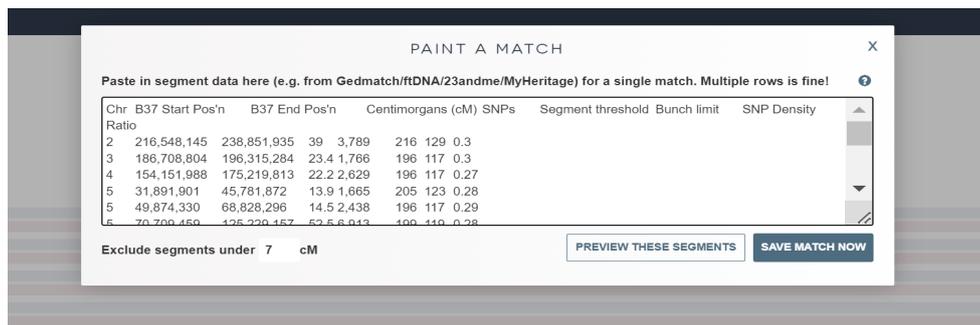
Segment threshold size will be adjusted dynamically with an average of 200 SNPs. About 2/3 will occur between 185 and 214 SNPs.

Minimum segment cM to be included in total = 7.0 cM

Mismatch-bunching Limit will be adjusted to 60 percent of the segment threshold size for any given segment.

Chr	B37 Start Pos'n	B37 End Pos'n	Centimorgans (cM)	SNPs	Segment threshold	Bunch limit	SNP Density Ratio
2	216,548,145	238,851,935	39	3,789	216	129	0.3
3	186,708,804	196,315,284	23.4	1,766	196	117	0.3
4	154,151,988	175,219,813	22.2	2,629	196	117	0.27
5	31,891,901	45,781,872	13.9	1,665	205	123	0.28
5	49,874,330	68,828,296	14.5	2,438	196	117	0.29
5	70,709,459	125,229,157	52.5	6,913	199	119	0.28
7	83,323,789	120,918,780	29.5	4,075	217	130	0.27
9	46,587	39,103,743	64.4	8,026	198	118	0.32
9	71,033,538	90,955,547	25.5	3,356	202	121	0.32
15	70,512,522	82,573,255	12.9	1,490	185	111	0.27
15	83,221,392	90,366,032	7.9	1,078	188	112	0.29
16	19,716,505	32,137,965	16.7	1,593	191	114	0.31
16	46,584,098	83,521,978	54.7	6,207	264	158	0.29
17	13,546	10,021,642	29.3	2,169	199	119	0.33
17	77,835,821	81,041,077	7.4	349	197	118	0.18
18	8,228,160	15,102,421	16.8	1,383	186	111	0.34
18	18,618,070	33,326,772	14.5	1,940	202	121	0.29
19	28,079,145	44,172,025	21.1	1,815	205	123	0.24
21	32,283,437	48,077,812	36.5	3,268	175	105	0.31

For the purpose of doing a chromosome map, all that we are interested in is the table of figures. Simply copy this table and go back to DNA Painter and click on 'PAINT A NEW MATCH'. Then paste in the figures you have copied and click on 'SAVE MATCH NOW':



15. This is what happens – you get a new window opening:

SAVE MATCH

We found 19 segments in your match data (excluding segments under 7cM).

Describe your connection to this match:

I know how I'm connected to this match

I don't yet know how I'm connected to this match.

Enter the name of your DNA match

Optional – This is just so you can identify the source of this segment in future. You could also enter their DNA kit number or username.

+ Add details about these match segments

If you know how you are connected, you can label these segments with the name of the ancestor you got them from.

+ More info

Enter your ancestor's name (or the name of the couple)

If you have multiple ancestors with the same name, you might like to include their birth year.

Is this match on your mother's side or your father's?

Each pair has one chromosome from your father and one from your mother. Do these segments look like they're from the maternal or paternal side? (If you're not sure, you can just select "Not sure")

Not sure (or both!) ▾

Colour

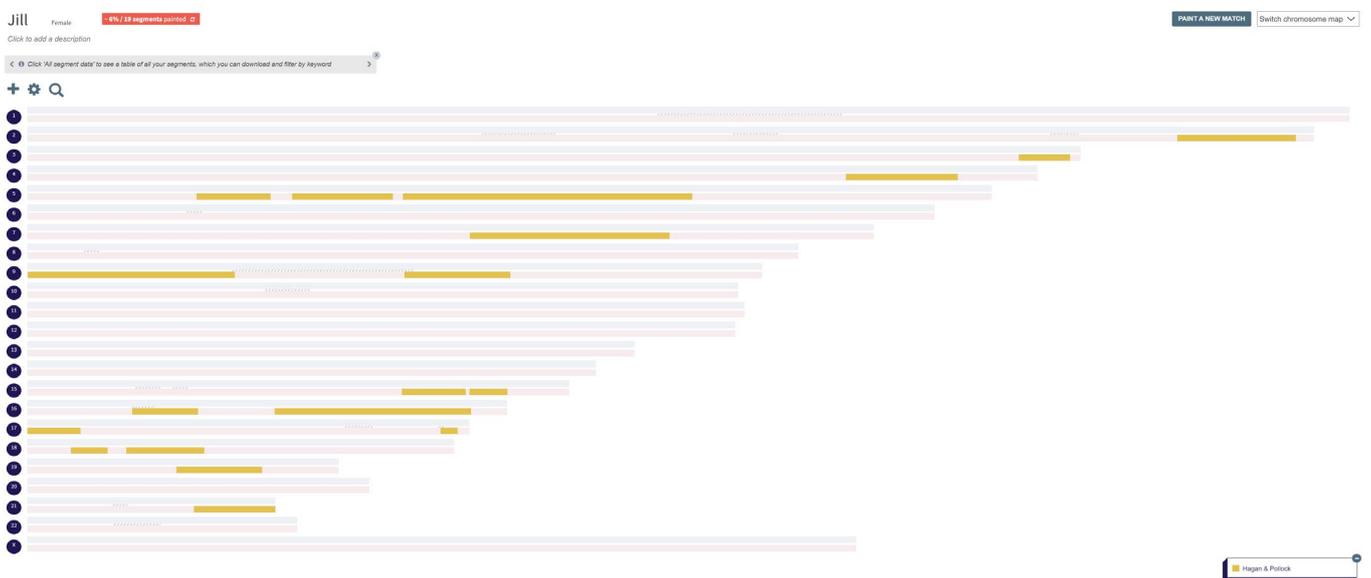
Yellow ▾

Notes for this group

Optional - add notes to describe this ancestor or group

SAVE MATCH

The details which this form requests must be completed – Jill knows how she is connected to this match, so she clicks on that option in red. The name of the DNA match is added and then the form asks for the ancestor or couple of ancestors that connect Jill to this match. Jill knows the couple is her M1 and M2 – Hagan & Pollock, so that is filled in. The match is on her mother's side, so maternal, and she chooses a yellow/orange colour as this is the colour for M1/M2. Then she clicks 'SAVE MATCH' and gets this screen:



19 segments (about 6%) are now painted yellow/orange and all are on the pale pink maternal chromosome lines.

- When you hover over a segment with your cursor it gives you details of that segment – who it is from, its size and its position on the chromosome.
- Now Jill needs to do the same procedure with any other known GEDmatch DNA matches. She gets the segment data for EG (paternal), Alma (maternal), eac (maternal), Ju (paternal) and paints it on the chromosome map, which now looks like this (and she will keep adding known matches):



- Once all the known matches from GEDmatch are added, we can move to check out matches at My Heritage. Click on the DNA tab and go down to DNA Tools, where this window opens:

Chromosome Browser
A tool for viewing shared DNA segments between you and multiple DNA Matches, which can help point to a common ancestor.

AutoClusters
An automatic tool that organizes your DNA Matches into clusters that likely descended from common ancestors

Ethnicities Map
Discover the most common ethnicities in each country, and find out the top countries for each ethnicity, based on data from MyHeritage DNA users.

- Click on Explore in the 'Chromosome Browser' box as shown above. A window will open as shown on the next page. You can then see if you recognise any of the DNA matches shown. If so, then click on that person. Jill knows that Tom is her first cousin once removed on her Hagan & Pollock M1 and M2 line and so it would be useful to add his matching segments to her chromosome map.

▼ Compare Add DNA matches Clear

Jill

Compare

Select DNA Matches DNA Match name

<p>Jean</p> <p>Shared DNA 49.2% (3,490.1 cM)</p> <p>Shared segments 23</p> <p>Largest segment 283.6 cM</p>	<p>Joy</p> <p>Shared DNA 35.9% (2,545.2 cM)</p> <p>Shared segments 42</p> <p>Largest segment 198.6 cM</p>	<p>E...</p> <p>Shared DNA 4.8% (342.8 cM)</p> <p>Shared segments 18</p> <p>Largest segment 46.6 cM</p>	<p>Tom</p> <p>Shared DNA 2.9% (202.2 cM)</p> <p>Shared segments 6</p> <p>Largest segment 64.4 cM</p>
<p>Anthony</p> <p>Shared DNA 1.1% (81.0 cM)</p> <p>Shared segments 6</p> <p>Largest segment 16.3 cM</p>	<p>Averil</p> <p>Shared DNA 1.1% (76.8 cM)</p> <p>Shared segments 8</p> <p>Largest segment 15.4 cM</p>	<p>Brett</p> <p>Shared DNA 1.0% (68.0 cM)</p> <p>Shared segments 3</p> <p>Largest segment 30.1 cM</p>	<p>Alma</p> <p>Shared DNA 1.0% (67.7 cM)</p> <p>Shared segments 4</p> <p>Largest segment 25.2 cM</p>
<p>Gillian</p> <p>Shared DNA 0.9% (61.8 cM)</p> <p>Shared segments 4</p> <p>Largest segment 28 cM</p>	<p>Nicola</p> <p>Shared DNA 0.9% (60.4 cM)</p> <p>Shared segments 4</p> <p>Largest segment 27 cM</p>	<p>Andrew</p> <p>Shared DNA 0.8% (57.5 cM)</p> <p>Shared segments 3</p> <p>Largest segment 29.5 cM</p>	<p>Kathleen</p> <p>Shared DNA 0.8% (55.8 cM)</p> <p>Shared segments 3</p> <p>Largest segment 23.7 cM</p>
<p>Dubba</p> <p>Shared DNA 0.8% (55.6 cM)</p> <p>Shared segments 2</p> <p>Largest segment 47.8 cM</p>	<p>Kevin</p> <p>Shared DNA 0.8% (55.1 cM)</p> <p>Shared segments 5</p> <p>Largest segment 30.4 cM</p>	<p>robin</p> <p>Shared DNA 0.7% (52.7 cM)</p> <p>Shared segments 6</p> <p>Largest segment 20.8 cM</p>	<p>Douglas</p> <p>Shared DNA 0.7% (50.6 cM)</p> <p>Shared segments 2</p> <p>Largest segment 43.8 cM</p>

20. When Jill clicks on Tom's name, she gets this:

Chromosome Browser — One-to-many ⓘ

Select up to 7 DNA Matches to view shared DNA segments

▼ Compare To one DNA Match —Add or remove DNA Matches or compare now Clear

Jill Tom

Compare

Click on 'Compare' to get the segments that Tom matches with Jill and then click on the arrow I have circled in green at the bottom of the page:

MyHeritage Home Family tree Discoveries Photos DNA Research

Chromosome Browser — One-to-many ⓘ

Jill and Tom share 5 DNA segments Add or remove DNA Matches

Jill Tom

Shared DNA 2.9% (202.2 cM)

Shared segments 6

Largest segment 64.4 cM

Show triangulated segments that are at least 8 cM

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

Shared DNA segments info Advanced options

▼ Tom and Jill share 6 DNA segments

This gives us the segment table that we can copy and paste into DNA Painter just as we did before.

21. Now go back to My Heritage and click the back button to return to the screen at the top of the previous page. Click on Tom to remove his name from the top and click on the name of the next person you want to add and repeat the process. Add all those matches whose connection you know.
22. You should by now have a chromosome map on DNA Painter which is starting to fill up.
23. Once you have mapped those DNA matches that you know, you can start 2 new groups of 'Unknown Paternal' and 'Unknown Maternal' matches in DNA Painter, using both GEDmatch and My Heritage unknown matches. As Ancestry now identifies which parent most of your matches come from (and it seems to be reasonably accurate) you should be able to label each unknown match as Paternal or Maternal. Then if they overlap with one of your known matches you can tell which ancestral line they come from.
24. Use a different unused colour for these unknown paternal matches and another unused colour for unknown maternal matches.
25. You will start to see a pattern building up where a lot of your unknown matches have the same segments as each other and thus are descended from the same ancestral line.
26. Over time, you will get more and more matches to add to your map and this should really help you with your unknown matches and which of your P1 to P4 or M1 to M4 lines they came from.
27. This is a very useful part of the DNA Painter website: <https://dnainter.com/help>
28. This video may be of use: <https://familytreewebinars.com/webinar/an-introduction-to-dna-painter/>