| Trait | Possible alleles | Your Phenotype | Your Genotype(s) |
|---|---|---|---|
| Tongue rolling | Able to roll (R) <br> Unable to roll (r) | 8. Able to roll | 9. RR or Rr |
| Freckles | Have freckles (F) <br> No freckles(f) | 10. Have freckles <br> **This is my phenotype** | 11. FF or Ff |
| Widow's peak | Widow's Peak (W) <br> Straight (w) | 12. | 13. |
| Earlobe | Free hanging (A) <br> Attached (a) | | 15. |
| Cleft chin | Have cleft (C) <br> No cleft (c) | 16. | 17. |
| Thumb | Hitchhikers (H) <br> Straight (h) | 18. | 19. |
| Dimples | Dimples (D) <br> No dimples (d) | 20. | 21. |
| Interlocking fingers (when hands are clasped) | Left thumb on top (L) <br> Right thumb on top (l) | 22. | 23. |

|   | **F** | **f** |
|---|---|---|
|   |   |   |
|   |   |   |

On the top I have placed the letters from the "other person" given in the lab report.
These letters represent the two alleles of a gene this person is carrying.
Since we inherit one allele from our mother and one from our father, we always have 2 letters (2 alleles). During the process of meiosis these alleles separate.

|  | **F** | **f** |
|---|---|---|
| **F** | | |
| **f** | | |

If you have the <u>dominate</u> phenotype you **MUST** complete the Punnett square by assuming you have the **heterozygote genotype** (Ff).
I have placed my genotype, one letter next to each box, on the side.

|   | F | f |
|---|---|---|
| **F** | **FF** | **Ff** |
| **f** | **Ff** | **ff** |
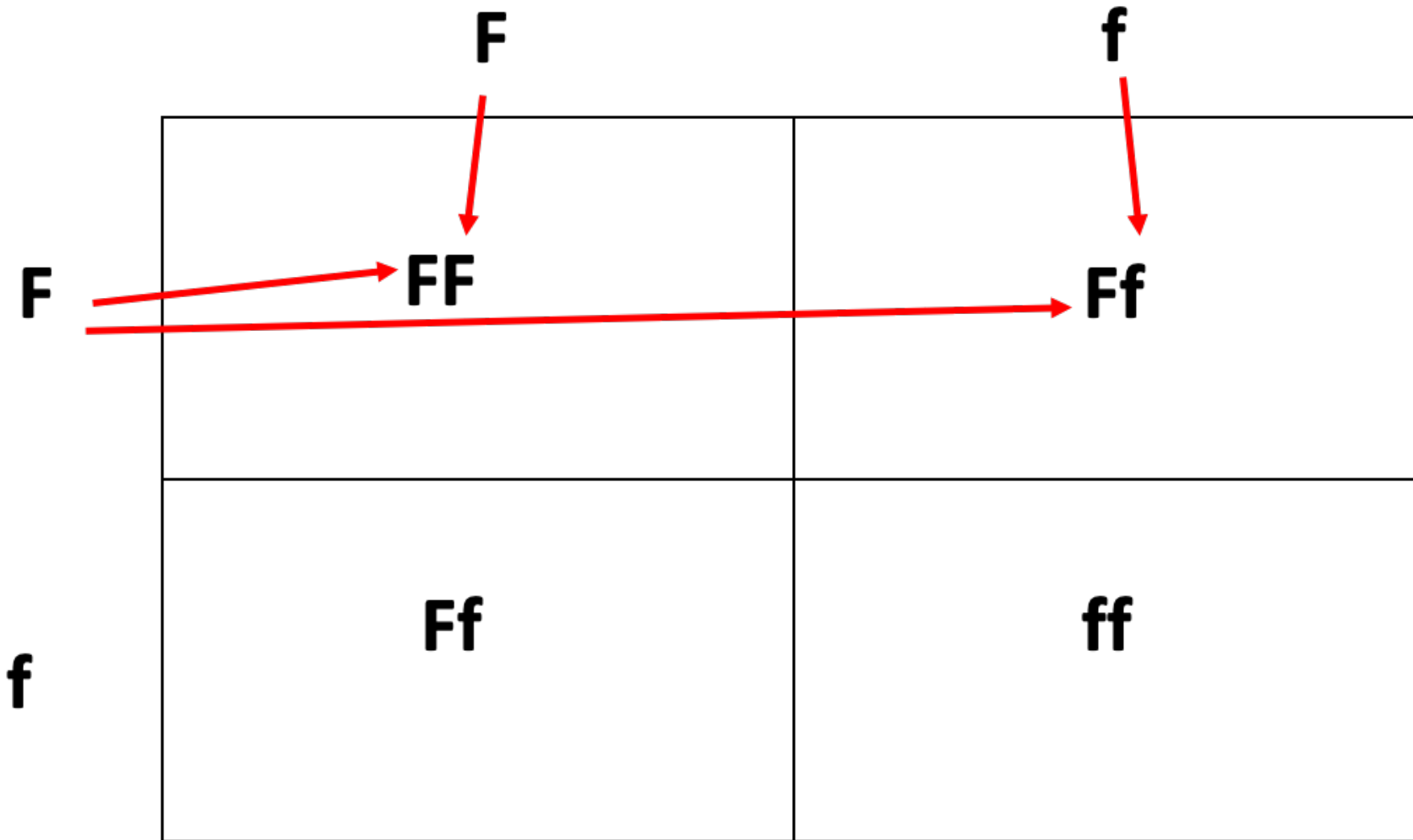
Now we can fill in the 4 squares of the Punnett square to see what phenotypes and genotypes the offspring from this mating could have. Follow the arrows to see how I filled in the top two squares

|       | **F** | **f** |
|-------|-------|-------|
| **F** | **FF** | **Ff** |
| **f** | **Ff** | **ff** |
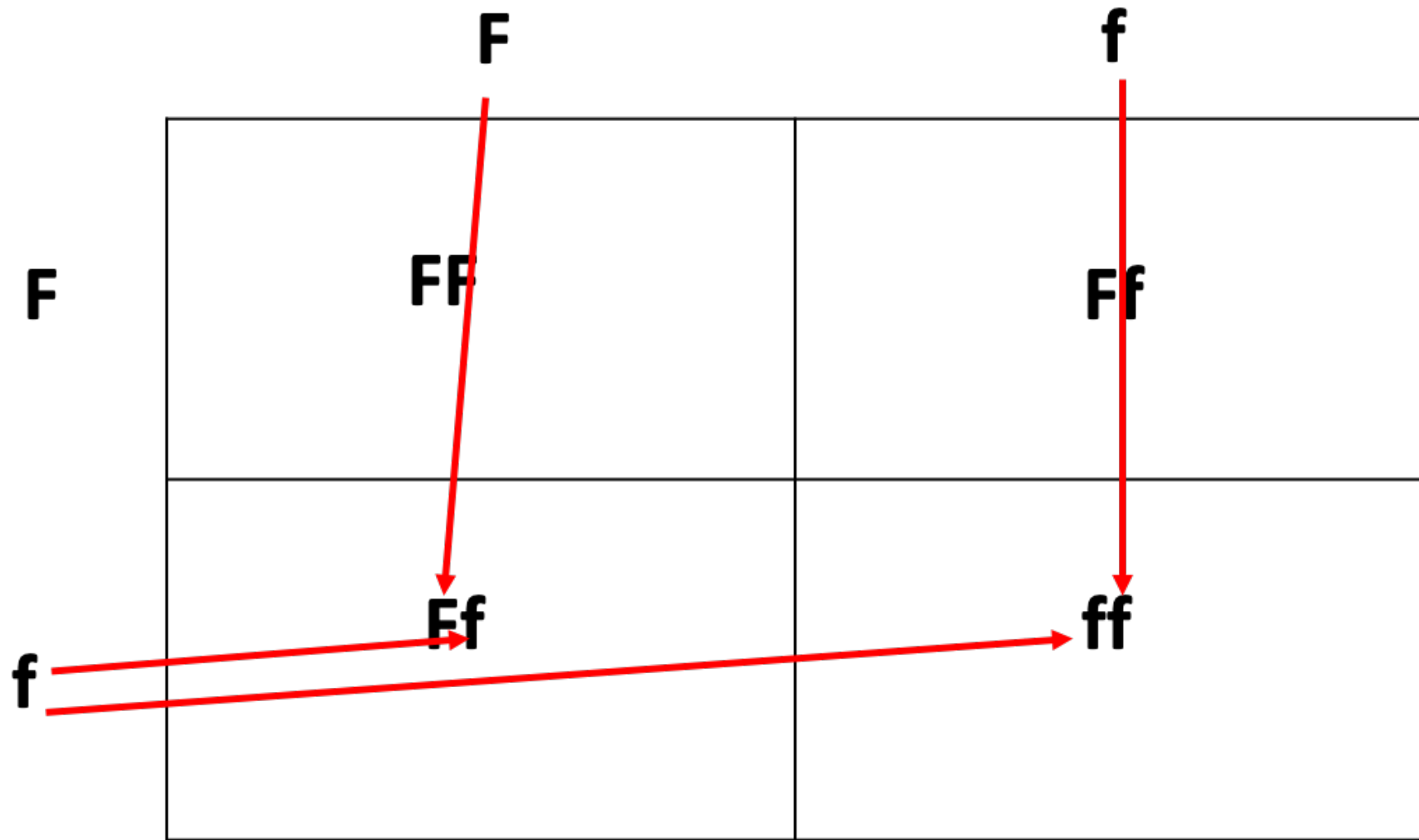
Follow the arrows to see how I filled in the bottom two squares

NOTE – The other person's genotype, which you are given has not changed.

|  | F | f |
|---|---|---|
| **f** | **Ff** | **ff** |
| **f** | **Ff** | **ff** |

This is what the Punnett square will look if you have the recessive phenotype.

When you are asked for the possible phenotypes there are always only 2 possible phenotypes (in this case freckles or no freckles).

These possible phenotypes are listed in Table 5.1.

| Trait | Possible alleles | Your Phenotype | Your Genotype(s) |
|---|---|---|---|
| Tongue rolling | Able to roll (R) Unable to roll (r) | 8. | 9. |
| Freckles | Have freckles (F) No freckles(f) | 10. | 11. |
| Widow's peak | Widow's Peak (W) Straight (w) | | 13. |
| Earlobe | Free hanging (A) Attached (a) | 14. | 15. |
| Cleft chin | Have cleft (C) No cleft (c) | 16. | 17. |
| Thumb | Hitchhikers (H) Straight (h) | 18. | 19. |
| Dimples | Dimples (D) No dimples (d) | 20. | 21. |
| Interlocking fingers (when hands are clasped) | Left thumb on top (L) Right thumb on top (l) | 22. | 23. |

**2 possible phenotypes are listed here**

To determine the possibility of having a child with each phenotype look at the squares you filled in.

Any box you filled in that has at least 1 capital letter "F" has the dominate phenotype (freckles) and boxes that only have a lower case "f" (ff) have the recessive phenotype (no freckles).

So, in this case the Punnett square using the dominate phenotype there is a 75% (3 of the 4 boxes) chance the offspring will have freckles (because they have the genotypes FF or Ff) and a 25% (1 of the four boxes) chance the offspring will have no freckles (because they have the genotype ff).

|  | F | f |
|---|---|---|
| F | FF | Ff |
| f | Ff | ff |

When we used the recessive phenotype there is a 50% chance the offspring will have freckles (Ff) and a 50% chance they will have no freckles (ff).

|   | F | f |
|---|---|---|
| f | Ff | ff |
| f | Ff | ff |

Now complete your Punnett squares and answer the questions in Part B