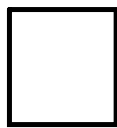
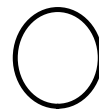


## Pedigrees part 1

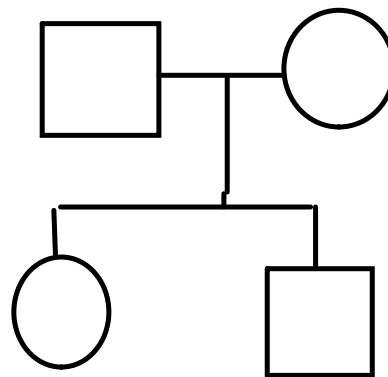
1. What is the pedigree symbol for a male?



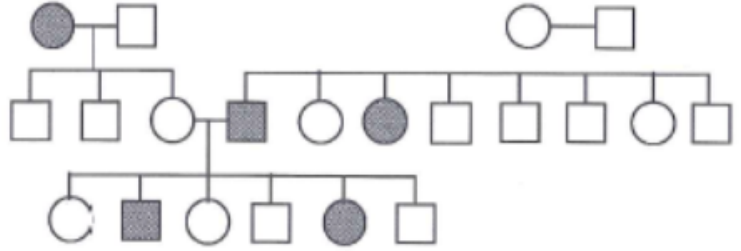
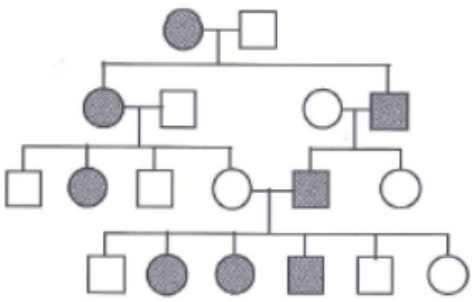
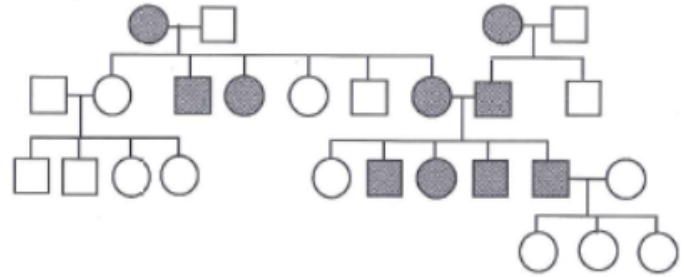
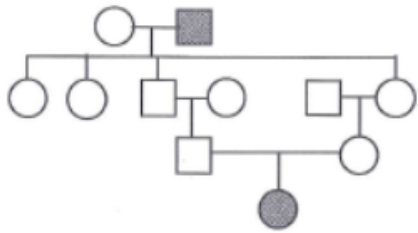
What is the pedigree symbol for a female?



How do you show that a male and a female have had biological children?





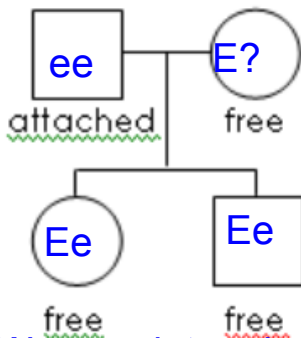


2. In order to solve pedigree problems, there are **specific strategies**.

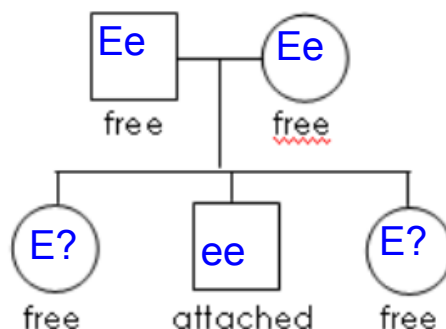
- First put in the genotype for all the individuals **exhibiting the recessive** trait as there is no question about what their genotype is.
- Second give each individual exhibiting the dominant trait, **one dominant gene**.
- Then **look above at the parents and below at the children**, when either is possible, to see if there are clues to help you solve the second gene for anyone with a dominant genotype.
- When you can't be certain what the second gene is, place a **question mark** in that spot.

**Sample problems:**

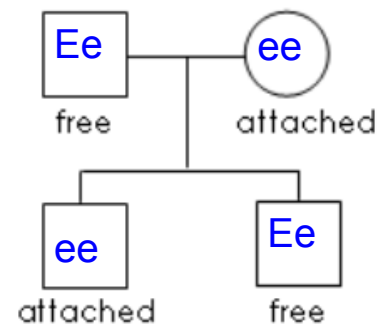
Earlobes: Free = **E**, attached = **e**



We can determine that both children have a second gene which is recessive as that is all the Dad can pass on.



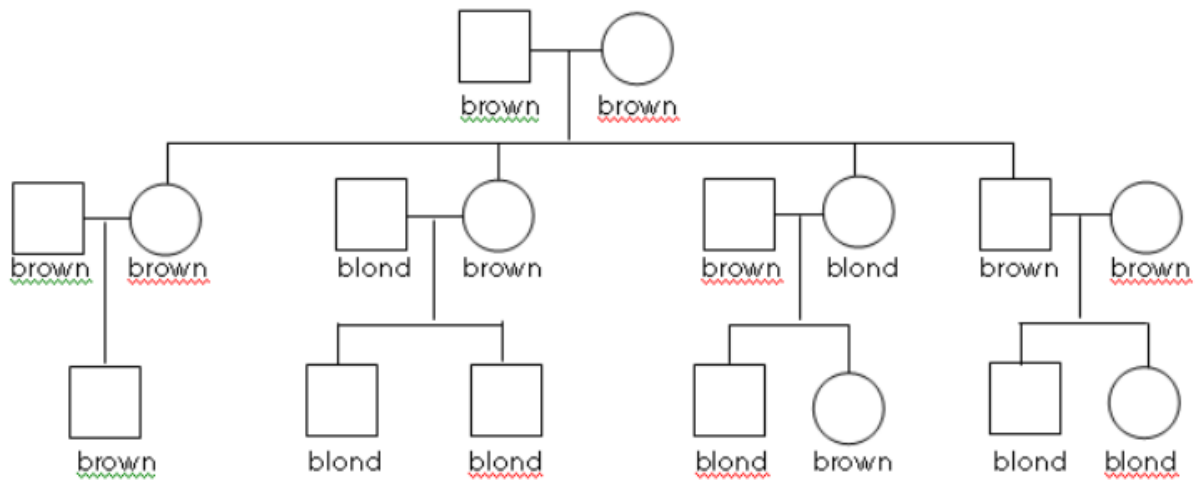
In order for the son to have attached ear lobes, both parents needed a recessive gene. We can't tell the second gene for the other two children for sure.



By following the above order of steps, a - d, you will do much better than jumping around when solving pedigrees.

**Pedigree Problems:** (1/8 per individual in each pedigree)

1. Hair color: Brown hair is dominant over blond. Brown = **B**, blond = **b**. (2 1/4 points)



5. Human blood types are both **codominant** and **recessive**. The genes for A ( $I^A$ ) and B ( $I^B$ ) are codominant while O ( $i$ ) is recessive to both A and B.
- Fill in the **codominant genotypes** for the **codominant phenotypes** as there is no choice.
  - Do the **recessive** phenotypes with their **genotypes** as again there is no choice.
  - Fill in **one dominant** gene for the individuals with the dominant trait.
  - Try to figure out the second gene for these individuals by looking at their parents and/or children.

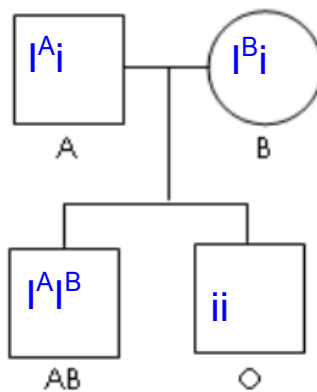
### Genes for blood type

$I^A = A$

$I^B = B$

$i = O$

### Sample Problem



Again follow the steps a - d to do the following problems successfully.

Since one child is type O blood, both parents needed to have a recessive gene.

Phenotypes and the possible genotypes for blood types.

$I^A I^A, I^A i = A$

$I^B I^B, I^B i = B$

$I^A I^B = AB$

$ii = O$