

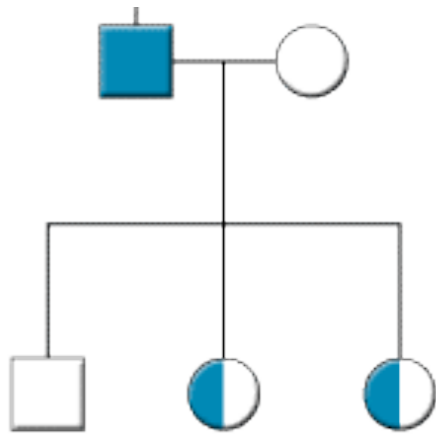
Lesson 6.3

Dragon Genetics, pt. I: Pedigree studies

Name

Date

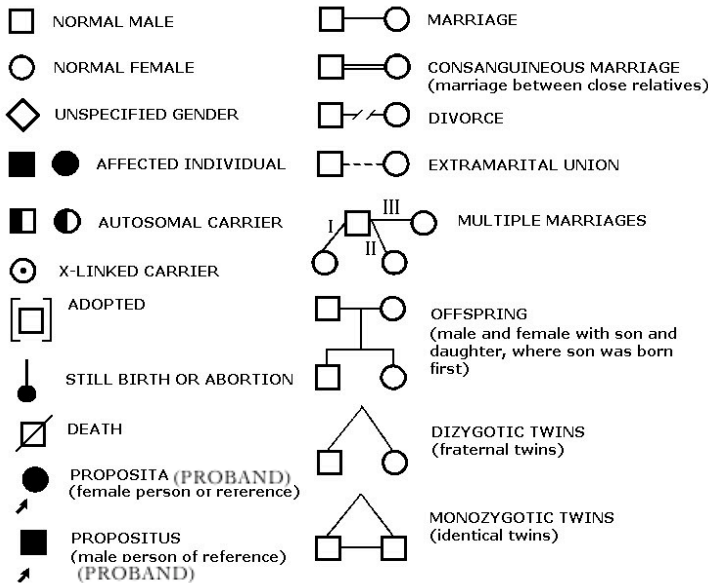
Period



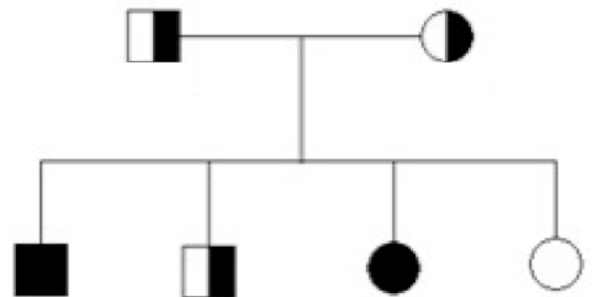
1. What do the circles and squares mean in the chart to the left?
2. Why are some shapes filled in completely and others unfilled?
3. What do the horizontal lines mean?

Explore I: Pedigree Problem set

Pedigrees are not reserved for show dogs and racing horses. All living things, including you, have pedigrees. A pedigree is a diagram that shows the occurrence and appearance, or phenotype, of a particular genetic trait from one generation to the next in a family. Genotypes for individuals in a pedigree can usually be determined with knowledge of inheritance and probability.



Pedigree practice: The pedigree below shows the pattern of inheritance in a dragon family for a specific trait. The trait being shown is visible ear-hole (see 6.12). Geneticists recognize two traits, visible ear-hole or no visible ear-hole. The gene responsible for visible ear-hole (D) is dominant over the gene for no visible ear-hole (d). In a pedigree, a Roman numeral represents each generation. Each dragon in a generation is numbered. Thus a generation numeral and number can identify each dragon. For the pedigree below, fill in the genotypes of each individual in the pedigree. Then, circle the offspring that will have *no visible ear-hole*.



Highlight the items in the key that we will use most often in this course.

 **Explain I**
Pedigree Practice

Dragon Pedigree: Follow the story below and create a pedigree chart.

This is the story of Grandma Dragona and Grandpa Fango, and their clan!! They tied the dragon knot back in 1933 and have been just like newlyweds ever since. From their union, Dragona laid and hatched four eggs. Elizardbeth, the eldest dragonette, was born in 1935. Flamo, a drake, soon followed in 1936. In 1939, Mistelle, the second dragonette was brought into this world. Finally, Mazik, also a drake, a surprise to the whole family was the baby of the family, not being born until 1950.

Elizardbeth fell in love at a young age, and wed her drake school sweetheart, Davik, in 1954. From this marriage, two bundles of joy came about (at the same time): Jonzo and Sunno – 1955 (twins!)

It took Flamo a little longer to find his soul mate. Finally in 1970, Flamo found the dragon of his dreams, Wiza, and they were married. Since they married so late in life, they only brought one new drake into this world: Barney – 1972

Mistelle was a hard-flying dragon, and never found time in her schedule for love. She led a very productive and fulfilling life, setting castles ablaze and hoarding gold, but she never did marry and have children.

Mazik was a wild one!! After a long string of female dragonettes, he finally chose Taglia to spend the rest of his life with. They were wed in 1975 and brought two girls into world: Tanis -1977, and Tiamat – 1979. They also sadly had an unhatched egg in 1980.

1. In the space below, create a pedigree of the dragon clan. Just start with male, females and generations – you will add the rest later. Dragon names ending in –a are typically female and ending in –o are typically male. Use the key above to help you.

2. Who are the daughter-in-laws of Fango and Dragona?
3. What is the relationship between dragons in the third generation?



 **Explain II**

Now that you have your pedigree chart together, shade the appropriate circles and squares using the information below. Remember that individuals who possess the RECESSIVE trait are to be filled in completely. Individuals not shaded in carry two dominant alleles. If they are a carrier, they will be half-shaded.

Dominant/Recessive Inheritance – Wings

Not having wings is a recessive trait. Grandpa Fango did not have wings, but his beautiful bride did. Flamo and Mistelle were the only two of their siblings to have wings. Of the grandchildren, the twins did not have wings, and neither did Barney, but the two girls did.

Using lesson 6.12 and following the steps below, determine the genotypes of all individuals in this pedigree chart for wings. Remember, having no wings is a RECESSIVE trait.

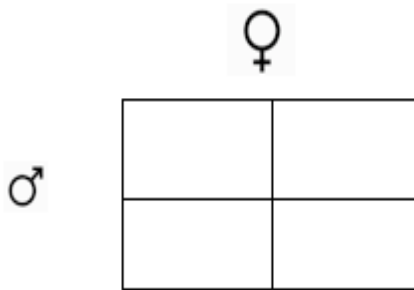
STEP 1: Assign two recessive genes to any dragon on the pedigree whose symbol is shaded. Small letters are written below the dragon's symbol. Typically the letter corresponds to the first letter of the dominant trait, and the recessive trait is just the lower-case version of the dominant

STEP 2: Assign one dominant gene to any dragon on the pedigree whose symbol is unshaded. A capital letter is written below the dragon's symbol

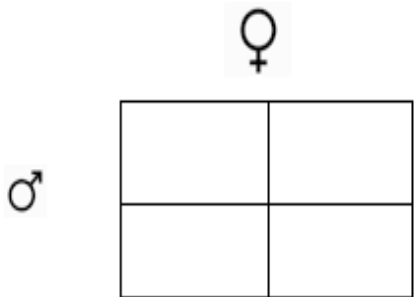
STEP 3: Using the information given to you determine the alleles for each dragon with the dominant phenotype.

We know that Grandpa Flamo does not have wings.

4. If Grandma was **MM**, could any **mm** children be produced from Grandma and Grandpa? Complete punnett squares to determine your answer. **(Show work!!)**



5. If Grandma were **Mm**, could any **mm** children be produced from them? Complete punnett squares to determine your answer. **(Show work!!)**



6. From my pedigree, what is Grandma's genotype?
7. What must be the genotypes of their children?
8. What are the genotypes of their grandchildren?
9. Label your pedigree with the correct genotypes for each generation.



Explain III

Listen/read along to the following song and try to solve this pedigree:

I was married to a widow, who was pretty as can be. This widow had a grown-up daughter, who had hair of red. My father fell in love with her and soon they too were wed. This made my dad my son-in-law, and really changed my life. Now my daughter was my mother, Cause she was my father's wife. And to complicate the matter, Even though it brought me joy, I soon became the father of a bouncing baby boy. My little baby then became a brother-in-law to dad, And so became my uncle, though it made me very sad. For, if-if he was my uncle, then that also made him brother. Of the widow's grown up daughter, who was of course, my stepmother. Uh huh. Father's wife then had a son who kept them on the run, and he became my grandchild, for he was my daughter's son. My wife is now my mother's mother, and it makes me blue. Because although she is my wife, she's my grandmother too. God. Now, if my wife is my grandmother, I am her grandchild, yeah. And every time I think of it, heh! Nearly drives me wild. Cause now I have become, the strangest case you ever saw, as husband of my grandmother, I am my own grandpaw. Oh I'm my own grandpa. I'm my own grandpa. It sounds funny I know, but it really is so, Oh I'm my own grandpa. I'm my own grandpa. I'm my own grandpa. Talk about incest! It sounds funny I know, but it really is so, I'm my own grandpa.