

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Case History 1: The Wilson Family

Peter and Susanna Wilson went to a genetics clinic shortly after they married. Several of their family members have Marfan syndrome, and they wanted to understand more about how this genetic disease is passed from generation to generation in families. They also wanted to learn whether one or more of their children might inherit this condition. People with Marfan syndrome tend to be unusually tall, with long limbs and long, thin fingers. Some people have other, sometimes severe, health complications. But many people with Marfan syndrome lead normal lives. It's thought that US president Abraham Lincoln, a very tall, thin man, might have had Marfan syndrome.

The genetics clinic took the following family history. Doctors used this information to construct a family pedigree to follow the pattern of inheritance for Marfan syndrome and explain to Peter and Susanna their chances of having children with the disease.

Family Member 1:  Peter Wilson  Marfan Syndrome?  No

All Known Relatives of Peter Wilson		
Family Member	Sex	Marfan Syndrome?
Mother: Renata Wilson	F	No
Father: Joseph Wilson	M	Yes
Brother: James Wilson	M	No
Brother: Greg Wilson	M	Yes
Sister: Cindy Wilson	F	No

Family Member 2:  Susanna Wilson  Marfan Syndrome?  Yes

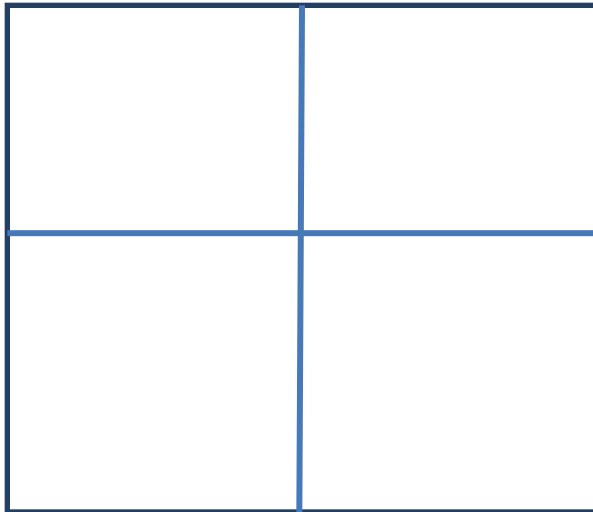
All Known Relatives of Susanna Wilson (Name before Marriage, Susanna Roberts)		
Family Member	Sex	Marfan Syndrome?
Mother: Maryanne Roberts	F	Yes
Father: Henry Roberts	M	No
Brother: Sam Roberts	M	Yes
Sister: Janet Roberts	F	No
Brother: Robby Roberts	M	No
Sister: Kathy Roberts	F	Yes

### Wilson Family Pedigree Instructions

Complete the Wilson family pedigree (handout 6.2) using information about Peter's and Susanna's families. Shade the circle or square of any family member who has Marfan syndrome. Marfan syndrome is caused by a dominant allele (M). Anyone who has at least one allele for Marfan syndrome will have the disease (Mm). Anyone who doesn't have Marfan syndrome must have two recessive alleles (mm). Use this information to figure out the possible allele combinations of each family member and write the allele combination under each person's name on the pedigree. If more than one allele combination is possible for an individual, write both combinations under the name.

## Punnett-Square Instructions

Create a Punnett square showing the possible allele combinations that Peter and Susanna's offspring might inherit. Begin by writing the alleles of each parent in the correct locations on the outside of the square. Then add the possible allele combinations in each box and calculate the expected ratio of offspring with and without Marfan syndrome.



What are the possible allele combinations that Peter and Susanna's children could inherit?

What is the number of times each allele combination occurs?

What ratio of children with and without Marfan syndrome might you expect?

## Discussion Questions

How would you explain to Peter and Susanna the chances that any of their children will inherit Marfan syndrome?

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Does the pattern of brothers and sisters with Marfan syndrome in Peter's and Susanna's families match what you would expect based on the alleles of their parents? Explain your thinking.

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