

STUDENT HANDOUT 3

Name: _____

The original X-ray pictures are from children in the Hayes family. The first lung X-ray belongs to Lizzie Hayes, who is 12 years old, and the second lung X-ray is from Laura Hayes, who is 10 years old. Their parents have brought them to the hospital because they both seem to have a chest cold. Through examining their X-rays and the results from their autoradiographs you have discovered that one of them has cystic fibrosis.

The Hayes family would like to know how Laura could have inherited the genes for cystic fibrosis while Lizzie did not. Mrs. Hayes is pregnant with their third child and would like to know what the chances are that this child has cystic fibrosis too. Use Punnett Squares to demonstrate this to the family.

Mom: Heterozygous for cystic fibrosis

Dad: Heterozygous for cystic fibrosis

1. What are the possible genotypes for Lizzie?

2. Could Lizzie have children who have cystic fibrosis? Explain your answer using a Punnett Square.

3. What are the possible genotypes for Laura?

4. Could Laura have children who do not have cystic fibrosis? Explain your answer using a Punnett Square.

5. The Hayes family would like to know the chances of their third child having cystic fibrosis. Do their odds of having a child with CF increase because they have one child who has cystic fibrosis?

6. Who has to carry the trait in order for the offspring to have cystic fibrosis?