

BLUE PEOPLE OF TROUBLESOME CREEK/PEDIGREES

Name: _____

The _____ family are from a small town called Troublesome Creek, Kentucky and are known for having blue pigmented skin.

This skin discoloration is due to a rare autosomal _____ genetic disorder called _____. This disorder is due to an abnormal amount of methemoglobin in the blood. Methemoglobin is a form of hemoglobin that can't carry _____.

DISCUSS with a PARTNER and WRITE your response below. Methemoglobinemia is a rare disorder that is only expressed if a person receives TWO RECESSIVE alleles. How do you think methemoglobinemia was able to be continually passed down through generation without getting covered up by a DOMINANT trait?

Geographic _____ of the families in Troublesome Creek is what caused the inbreeding and passing of rare traits.

Punnett Squares Vs. Pedigrees

_____ shows the probability of potential offspring between parents

_____ are a representation of a family tree that shows the inheritance of a genetic trait through generations.

_____ is a heterozygous person that receives a recessive allele for a genetic trait, but doesn't display the trait.

Fill in the table:

	Homozygous Dominant Male
	Homozygous Recessive Male
	Heterozygous Male (Carrier)
	Homozygous Dominant Female
	Homozygous Recessive Female
	Heterozygous Female (Carrier)

	Parents
	Parents are Related to Each Other
	Offspring

Create a Pedigree showing the heredity of methemoglobinemia in the Fugate Family. Use your notes from the previous page along with the clues below to create a pedigree using the symbols on your desk.

Inheritance of Methemoglobinemia in the Descendants of Martin Fugate:

1. Martin Fugate immigrated to America and settled in Troublesome Creek, Kentucky. According to family records he had blue tinted skin. Martin married Elizabeth Smith, who was a carrier for methemoglobinemia.
2. Martin and Elizabeth had 7 children. 4 of which were blue. One of the 4 blue children was a boy named Zachariah.
3. Zachariah married Mary Smith who is one of his mother's sisters. They had many kids. Every one of their kids phenotypes were normal skin color. One of their kids was a boy named Levi Fugate.
4. Levi married a young lady that belong to one of the other 3 families that lived in the isolated area of Troublesome Creek. Her first name is unknown, so we will refer to her by her last name "Ritchie". Levi and "Ritchie" are distant cousins.
5. Levi and "Ritchie" had 8 children. One of their 8 children named Luna had blue tinted skin.
6. Luna married a man from one of the other families in the area by the name of John Stacy. They had 13 children, but none of them were blue.
7. One of Luna's sons Alva Stacy married Hilda Godsey and they had a baby boy named Ben Stacy. Ben was born with blue tinted skin. He grew out of it as he got older and now only his lips and fingernails turn blue when cold or angry. (Didn't maintain his blue pigment, therefore, he's a carrier)

DRAW your PEDIGREE in the space below. Once your pedigree is drawn, your challenge is to determine the **GENOTYPES** of each **INDIVIDUAL** on the pedigree. Use your understanding of pedigrees to determine if each person is **HOMOZYGOUS DOMINANT**, **HOMOZYGOUS RECESSIVE**, or **HETEROZGYOUS** for methemoglobinemia. **NOTE:** You do not need to include all offspring only the specific ones named above.

If B stands for the **NORMAL** gene and b for the **"BLUE"** gene, BB and Bb are normal and bb is **"BLUE,"** write the genotypes for the individuals in the pedigree. If it is impossible to tell if the second gene is dominant or recessive, use a **"?"** to represent that allele.

Martin Fugate _____	Elizabeth Smith _____	Zachariah Fugate _____
Levy Fugate _____	"Ritchie" _____	Luna Fugate _____
John Stacy _____	Alva Stacy _____	Hilda Godsey _____

