

LESSON NOTE FOR WEEK FOUR (4)

SUBJECT TEACHER: MR. PRINCEWILL WILSON

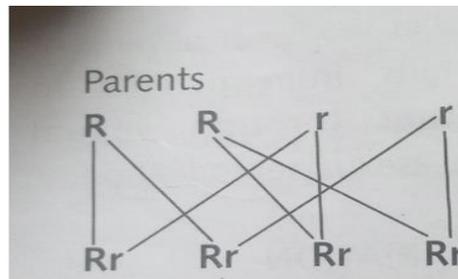
TOPIC: Family Trait

OBJECTIVES

In today's class, we will be talking about the family trait. Enjoy the class!

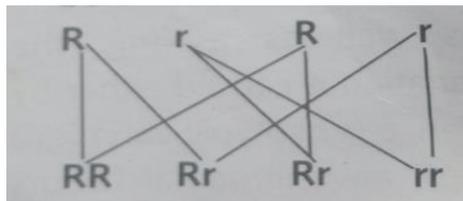
Gregor Mendel experiment

Gregor Mendel was a monk and he experimented on garden pea plant in the garden of the monastery where he lived. He artificially crossbreeds a red garden pea flower (RR) with a white garden pea flower (rr). The product of this crossbreeding (offspring) all appears to be red, which means the red colour is dominant and the white colour is recessive. The products of Gregor Mendel's experiment is referred to as the F1 generation. Gregor Mendel's cross-breeding can be illustrated as shown below:



F1 generation. The phenotypic ratio is 100%.

To get the F2 generation, we will have to cross-breed the F1 generation as shown below.



F2 generation

For F2, the phenotypic ratio is 3:1, and the genotypic ratio is 1:2:1.

Importance of family traits

Importance of family traits includes:

1. **Intelligence:** Parents with high intelligence quotient mostly give birth to intelligent offspring. This type of trait seems to be continuous from one generation to another.
2. **Disease:** With adequate knowledge of genetics, many genetic diseases can be prevented from being transferred from parents to offspring. Prospective couples are counselled to ascertain their genetic make-up before going into marriage to avoid transmitting diseases. Unlike in the past when people go into marriage without knowing their genetic make-up, which usually led into passing their genetic diseases such as albinism, sickle cell anaemia, colour blindness, down from one generation to another due to inadequate knowledge of Genetics.

3. **Resemblance:** Resemblance is a very common family trait which helps to identify members of a family.
4. **Family genealogy:** The knowledge of family trait makes it easy to trace the ancestor of a family (lineage) and then use it to predict the present and future traits through the discovered traits.
5. Knowledge of family traits helps in crime detection.

Blood group and genotype

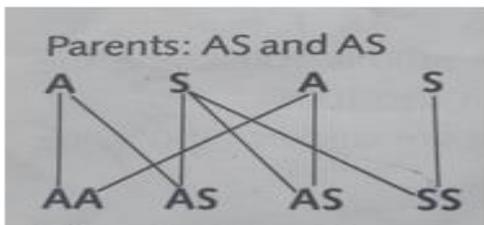
Blood group is also a very common family trait, there are four main types of blood group: A, B, AB, and O. If a man (husband) has a blood group A, and woman (wife) has a blood group B, then there is a possibility that their offspring will have blood group A, B, AB or O.

The genotype is another factor to consider in family genealogy, there are four main types of genotype: AA, AS, SS, and AC.

For example, if a man and a woman are both sickle cell carriers (AS) there is a possibility of producing normal offspring and a sickler as illustrated below:

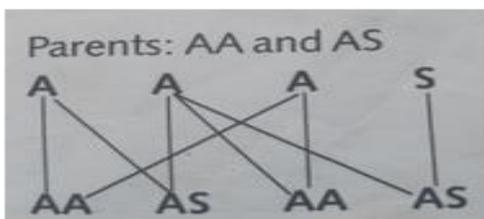
Parent: AS and AS

Parent: AS and AS



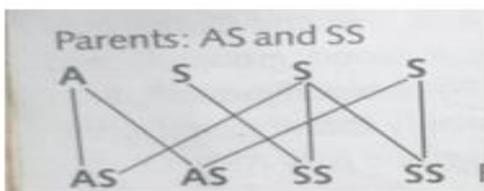
F1 generation

Phenotypic ratio is 3:1 while the genotypic ratio 1:2:1. 25% of the offspring are normal, 50% are carriers and 25% are sickles.



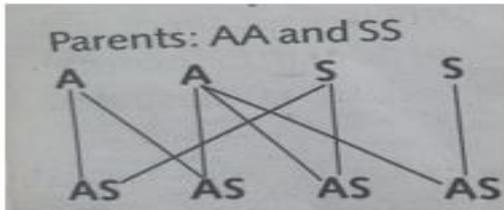
F1 generation

phenotypic ratio is 100% while the genotypic ratio is 1:1. 50% of the offspring are normal while the other 50% are carriers.



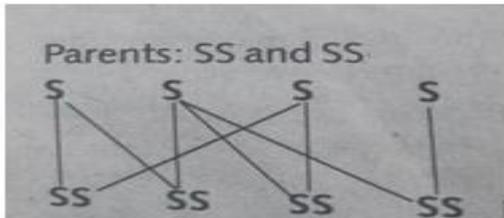
F1 generation

The phenotypic ratio 1:1 and the genotypic ratio is also 1:1. 50% of the offspring are a carrier and 50% are sickles.



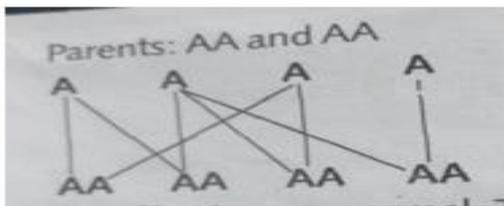
F1 generation

The phenotypic ratio is 100% and the genotypic ratio is 100%. All the offspring are a carrier (100% are carrier).



F1 generation

All offspring are sicklers.



F1 generation

All offspring are normal. The phenotype is 100% and the genotype is also 100%.

Family tree

A family tree or pedigree is a diagram that represents the relationship among families, i.e. relationships between parents and their offspring from one generation to another. The first generation includes their children; the second generation includes their grandchildren, etc.

A family tree consists of both horizontal and vertical lines that show the relationship between the father and mother, their children and their successive generation. The family tree can be used to trace the generation of the parents or can be used to trace the generation of either the father alone or that of the mother alone.

Types of family

There are two main types of family, they are:

1. Nuclear family
2. Extended family

1. Nuclear family:

This is a type of family that involves the man (husband), the woman (wife/wives) and their child/ children. This type of family can be further divided into:

- Monogamous family
- Polygamous family

Polyandry family

Monogamous family: This consists of the man (husband), the woman (wife) and child/children. In this type of family, the child/children receive(s) their stability from the husband and wife. A monogamous family is mostly practiced in the Western world.

Polygamous family: This consists of a man (husband) and multiple wives. Polygamous family is mostly practised in Africa.

Polyandry family: This is another type of polygamous family, which consists of a woman and multiple husbands. This family type is common in some parts of India.

2. **Extended family:**

This consists of relatives (cousins, uncles, aunties) living in the same home with a man (father), the woman (mother), and the children.

ASSIGNMENT

1. What is Family Tree? State the different types of family.
2. State the different Blood Groups and Genotype we have.
3. What is Family Trait? State any five (5) importance of Family Trait.