Genetic chapter bio

Sexual reproduction and meiosis

Sexual reproduction

- Sexual reproduction needs to parents father and mother
- It mixes genetic information from both parents
- Offspring are genetically different from each parent

Asexual reproduction

- One parent makes a copy of itself

Gammetes

- Parents make gametes
- Male gamete = sperm
- Female gametes = egg
- Normal human cells have 46 Chromosomes
- gametes have 23 chromosomes

Fertilization

- A sperm fuses with an egg
- These zygote has 46 chromosomes
- These zygote divide by mitosis and becomes an embryo
- The embryo gets mixed chromosomes from parents mixture of characteristics

Plants

Male gametes = pollen

Female gametes in ovary at the bottom of stigma

Meiosis

- It is a type of cell division that makes gametes
- Meiosis does not make identical cells
- in humans meiosis happens only in testis and ovaries

Steps of meiosis

- DNA duplicates means each chromosome makes a copy
- Chromosome line up in pairs in middle of the cell
- Pairs are pulled apart , new cells get only one chromosome from each pair these mixing creates genetic variation
- Chromosomes line up again and the chromatids are pulled apart
- Result will be four haploid gametes and they are all genetically different

DNA

- BNA stands for deoxyribonucleic Acid
- DNA is made up of repeating units called nucleotides

- DNA is a long molecule that has instructions for how you look and how your Body Works
- Each nucleotide has sugar, phosphate and base
- Bases = A, T , C , G
- Base pairing, DNA has two strands means double helix
- basis pair like this
- A pairs T
- C Pairs with G

Paired basis are held by weak hydrogen bonds

- Protein synthesis is how cell reads DNA instructions and make protein

Chromosomes and genes

- Chromosomes are the long coiled DNA
- They are found in nucleus
- a gene is a small section of DNA that codes for a protein
- All DNA = Genome

Extracting DNA from fruit strawberries

- Mash strawberry and mix with detergent and salt
- Detergent breaks cell membrane
- salt makes DNA stick together

- Then you have to filter the mixture
- and Ice cold alcohol gently
- DNA appears as White strings and can be lifted out

Mendel

Mendel was a scientist who found out how traits are passed from parents to children

Genetic diagrams

- Genetic variants or Alleles = Different versions of same gene like A or a
- You have to alleles for every genes one from each parent

Inheritance

inheritance is passing genes from parents to off spring

Homozygoes and heterozygous

In homozygous Both alleles are same (BB) bb
In heterozygous there are different alleles (Bb)

Dominant and recessive

- Dominant alleles are shown by capital letter B
- Recessive alleles are shown by small letter b
- Dominant alleles covers recessive alleles
- Recessive trait shows only if both alleles are recessive bb

genotype and phenotype

- Genotype is the allele you have BB , Bb , bb
- Phenotype is the characteristic you show Like Blue Eye, long hair

Gene mutation

It is a change in DNA that makes a new allele

Sex determination

- Humans have 23 chromosome pairs
- 23rd Pair is the sex chromosome
- male is XY
- Female = XX
- All eggs carry X
- Sperm carries x or y , sperm decides boy or girl
- Probability is 50% chance of boy and 50% chance of girl

Family Pedigrees

- Show how genetic disorders run in families
- Example cystic Fibrosis
- It is caused by recessive allele f
- Carriers Ff
- And the one those have that disease ff
- ff= afftected
- Ff= carrier
- FF= unaffected

Variation

Variation means differences within a species

Genetic variation

- caused by different Alleles
- Caused by mutations
- caused by mixing of alleles in sexual reproduction

Environment variation

- Caused by surroundings
- Example
- plant in Sunlight are green and healthy
- plant in dark are tall and yellow

Most characteristics= mixture of genes and environment

Human Genome Project

What scientist did

- Started in 1990 finished in 2003
- Found positions of 20500 human genes
- Identify many genes link to diseases

Uses

prevent disease

test and treat inherited disorders

personalized medicines

Problems

increased stress
discrimination by employers and insurance