

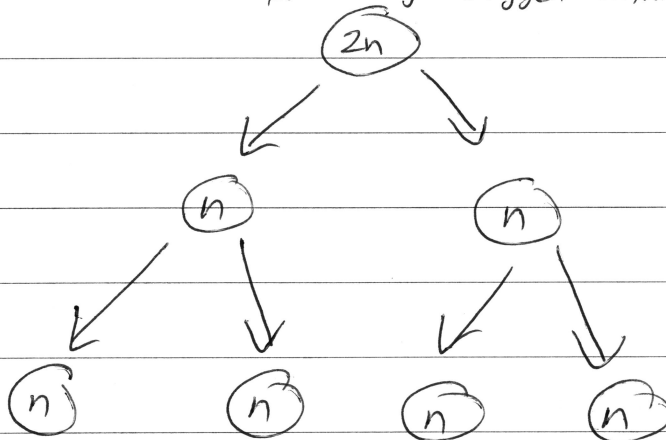
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a) Mutations affecting chromosomal number.

Mutation.	Effects. Effects.
Trisomy.	Affects the number of chromosomes produced. This leads to Trisomy-21 (Down Syndrome)
Polyplidy	Affects more than one chromosome.
Base Substitution.	The bases are replaced and substituted. eg. Sickle cell anaemia. GAG (glutamic acid) replaced by GTG (valine).

sickle cell anaemia changes the shape of red blood cells. It leads to vessel occlusion and reduces the ability to carry oxygen within the blood.

b).



Mitosis	2n	Somatic Identical	Cell growth, repair and maintenance.
Meiosis	n	Genetic non-identical	Sexual reproduction.

c) 1) Dominant -

11). linked : 9:3:3:1.

not linked : 3:1.

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d) 1). The distance of genes and the order of genes on the chromosome identify the relative position of linked genes. FISH is a technology used to identify the relative position of linked genes by using fluorescent light.

ii). There are limitations to the human genome project. 97% of DNA are junk DNA. DNA does not code for proteins.

Genes interact with ^{many} other genes however the Human Genome Project does not show these interactions.

e) Gene cloning allows the production of identical organisms. To achieve gene cloning technologies such as recombinant technology ^{are needed} to clone genes. Firstly, a plasmid is extracted from the DNA, and using a restriction enzyme such as EcoRI the introns are cut out of the DNA leaving the exons. The plasmid is then inserted into the DNA to allow cloning to occur. Gene cloning reduces ~~the~~ the variability in the "gene pool".