How can databases be used by biologists for the following:
- To store the information from the human genome project
  As base sequences are discovered they are added to
- To find specific DNA base sequences
  A biologist can search for a specific sequence in all the
- To help find the function of specific genes
  Correlations can be found between genes and characteristics in the
- In the classification of living organisms
  similarities in the DNA between species can be compared using

Meiosis – write 3 words to summarize each phase of meiosis
1. P I  Prophase - DNA coils up
2. M I  Metaphase chromosomes line
3. A I  Anaphase - homologous chromosomes
4. T  Telophase - daughter cell forms
5. P II  Prophase - DNA coils up
6. M II  Metaphase - chromosomes line
7. A II  Anaphase - homologous chromosomes
8. T II  Telophase - daughter cell forms

Sex-linked inheritance is when the gene (and its alleles) are found on the _X_ chromosome (sex)
Symbols for alleles for Sex linked haemophilia are
- X<sup>H</sup>
- X<sup>H</sup>
- Y<sup>+</sup>  (only 3)
Symbols for alleles for red-green colour blindness are
- X<sup>R</sup>
- X<sup>r</sup>
- X<sup>r</sup>

Dominant, recessive and co-dominant alleles in ABO blood groups
The allele symbols for ABO blood groups are:
- P<sup>+</sup>
- P<sup>-</sup>
- P<sup>-</sup>

Multiple alleles is when
There are more than two alleles for

Blood group genotypes can be
- Group A  --- 
- Group B  ---

Non-disjunction can cause the condition called
Downs
To obtain cells for a karyotype analysis using karyograms doctors use these two methods:
- Chorionic villous
- Amniocentesis
Risks to unborn baby and mother are:

What is the difference between a karyogram and a karyotype?
A karyogram is the diagram, of photos
on card, or digital representations
Karyotype refers to the actual
What are sister chromatids?
Two chromatids on the same
& homologous chromosomes?
A pair of chromatids each containing

Base substitution mutations - cause sickle cell anaemia
What are the effects of a base substitution on each of the following
- DNA: There is a permanent change in the sequence of bases in the DNA
- mRNA: The mRNA codon transcribed is changed
- Amino acid sequence: GAG codes for GLU but GUG codes for VAL
- Haemoglobin: The change in amino acid changes the

Mendelian genetics and peas simple inheritance and punnet grids
Show the cross between two heterozygous plants. Name the
- parental genotypes PP and pp
- gametes P & p
- offspring genotype 1PP:2Pp:1 pp
- offspring phenotype 3 pink:1

PCR is a technique that can
- make multiple copies of DNA very rapidly using heating and

Gel Electrophoresis can separate
- fragments of DNA of

DNA profiling is
- comparing the pattern of DNA fragments which separate in gel electrophoresis

Genetically modified organisms (GMOs)
Examples of GMO Bacteria that can be genetically engineered to make a useful product are:
1. E. coli to make insulin
2. E. coli to make human growth hormone

Natural clones occur in many species, examples include;
- asexual reproduction / vegetative or identical twins.

Therapeutic cloning is
- Production of cells for use in

Reproductive cloning by somatic cell transfer is
- the production of a new organism using an adult cell nucleus

Mutagens & radiation can cause
cancer
Ethics
Risks of GMO crops
GMO pollen could pollinate wild species
There could be unexpected effects
Benefits of GMO crops
Increased crop yield
Reduced use of pesticides (e.g. in pest...