1. Instructions for how an organism develops are found in the nucleus of its cells.
2. Genes are instructions for how a cell makes proteins.
3. Genes are sections of very long DNA molecules that make up chromosomes in the nuclei of cells.
4. Sex cells have only a copy of one chromosome from each pair.
5. Chromosomes (and genes) in body cells are in pairs because they come from each parent's sex cells.
6. Chromosomes in a pair carry the same genes in the same place, but that there are different versions of genes called alleles.
7. A person may have two alleles the same or two different alleles for any gene.
8. Offspring may have some similarity to their parents but can differ from each other because of the combination of the mother's and father's alleles in the fertilized egg.
9. Human males have sex chromosomes XY and females have sex chromosomes XX.
10. A gene on the Y chromosome determines the sex of a human embryo. This gene is linked to the development of testes in males and ovaries in females.
11. Most characteristics are determined by several genes working together, for example, height.
12. Most characteristics are also affected by environmental factors, for example, lifestyle factors contributing to disease such as cancer.
13. A small number of disorders are caused by alleles of a single gene, e.g. Huntington's disorder and cystic fibrosis.
14. The symptoms of Huntington's disorder are a progressive loss of memory and ability to control muscles.

15. The symptoms of cystic fibrosis are an increased risk of lung infections and poor digestion due to thick, sticky mucus in the organs.

16. A person with one recessive allele will not show the characteristic, but is a carrier and can pass the allele to their children.

17. The implications of testing adults and fetuses for alleles which cause genetic disease for example are:

    - Whether or not to have children at all.

    - Whether or not a pregnancy should be terminated.

18. Testing embryos for embryo selection (preimplantation genetic diagnosis) means that some embryos will be discarded.

19. The use of genetic testing by others could include genetic screening programmes, by employers and insurance companies.

20. Gene therapy may make it possible to treat certain genetic diseases.

21. Bacteria, plants and some animals can reproduce asexually to form clones (with identical genes to their parent).

22. Any differences between clones are likely to be due only to environmental factors.

23. Clones of animals occur:

    - Naturally, when cells of an embryo separate (identical twins).

    - Artificially, when the nucleus from an adult body cell is transferred to an empty unfertilised egg cell.

24. Embryonic stem cells are unspecialised cells that can develop into any type of cell.

25. There is the potential to use stem cells to treat some illnesses.

26. The cells of multicellular organisms become specialised during the early development of the organism and so stem cells may replace damaged specialised cells.