

## B2 – Genetics Quiz

1. What happens to genetic material before a cell divides?

It is copied

2. How many chromosomes are there in human body cells?

23 pairs (46) in all human body cells apart from gametes (sex cells) which contain 23 chromosomes.

3. The importance of Mendel's work was not recognised until the early 1900s. Why?

He was a monk, not a respected scientist and genes had not been discovered yet.

4. Suggest one reason why many people support the screening of embryos for the cystic fibrosis allele.

To reduce health care costs.

5. Suggest one reason why many people are against embryo screening.

Could damage embryo; expensive; embryos have a right to life

6. What is the genetic makeup of a boy and a girl?

Girl is XX and boy is XY

7. What is the chance of having a boy/ girl?

50:50. XX and XY make XX, XY, XX, XY

8. Why can you not blame a woman for only giving birth to girls?

To make a boy, a Y chromosome is needed which must come from the male.

9. Explain why we look similar but not identical to our parents.

We inherit the genes from both our parents so our alleles may be different.

10. What are the symptoms of cystic fibrosis?

Sticky mucus, difficult breathing, digestion difficult

11. What are the symptoms of Huntington's disease?

Brain deterioration, involuntary muscle movement, starts in middle age.

12. Describe meiosis.

Chromosomes double, separate into two sets, divide again so there are now four sets, each cell has now got half as many chromosomes as the original cell. This is how the sex cells are created (gametes).

13. Evaluate the use of embryonic stem cells.

Pros- widely available, treat many different diseases Cons- possible harm to embryo, may not work, embryos not consulted. Adult stem cell use is quick, well tested, safe but is painful and can currently treat few diseases.

14. What is an allele?

Forms of the same gene

15. What does recessive mean?

Only expressed if both alleles are present

16. What is a carrier?

Someone who carries the faulty, recessive allele as well as the healthy, dominant allele.

17. Why do most organisms have an even number of chromosomes in their body cells?

Because chromosomes come in pairs.

18. What is The function of DNA?

To code for a sequence of amino acids which form specific proteins such as enzymes, eye colour etc.

19. Why is it important for body cells to divide by mitosis?

To make new cells for growth, repair and asexual reproduction.

20. Describe the differences between mitosis and meiosis.

In mitosis the cell divides once, in meiosis twice. Mitosis produces two identical daughter cells, meiosis produces sex cells with half the number of chromosomes. Meiosis leads to variation. Mitosis is asexual, meiosis sexual; mitosis needed for growth, meiosis for making gametes; meiosis happens in ovaries and testes, mitosis everywhere else.

21. What is the chance of a baby having cystic fibrosis if both parents are carriers?

1:4 chance  $Cc \times Cc$  will give  $CC$ ,  $Cc$ ,  $cC$  (healthy, two carriers)  $cc$  (sufferer)

22. How does meiosis give rise to variation?

Gametes fuse during fertilisation, offspring receives alleles, which may differ, from both parents

23. What is the meaning of the word homozygous / heterozygous?

Homozygous means having two identical alleles; heterozygous means the opposite.

24. Polydactyly is a dominant disease. What is the genotype of a man who is a sufferer?

DD or Dd

25. What is a gene?

A small section of DNA

26. The colour and shape of flower petals are known as what?

Characteristics

27. What is the name of the thread like structures found inside the nucleus of a cell?

Chromosomes