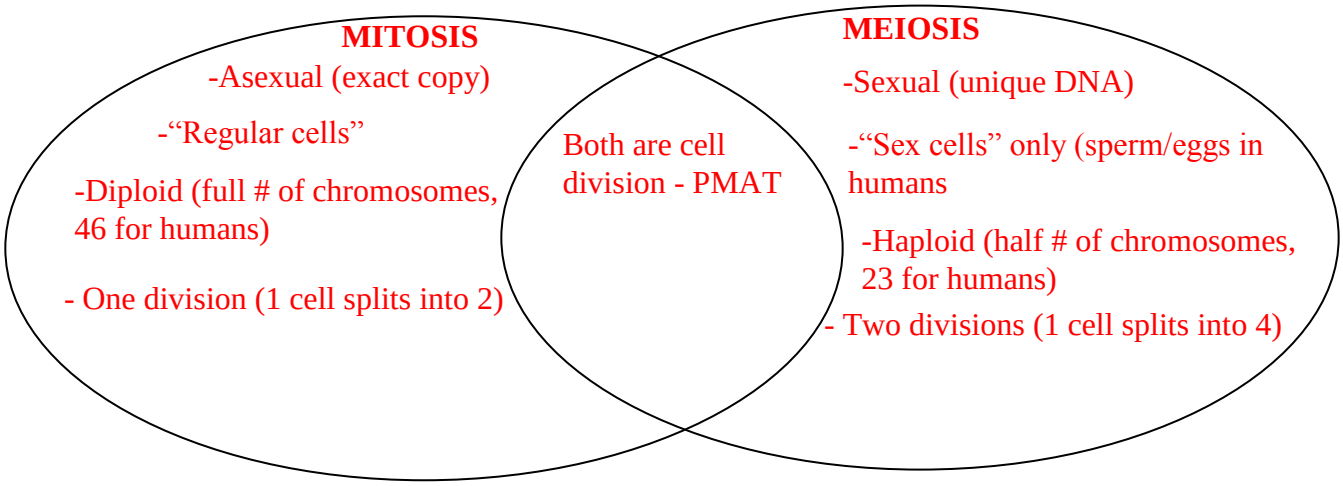
Science 9 **Reproduction Unit Review**

1. What is the function of
   a) The cell membrane of a cell? b) The cytoplasm?
   a) To protect the cell and control what goes in and out (semi-permeable).
   b) A gel-like substance that holds the contents of the cell in place and provides a medium for chemical reactions and other cellular functions.
2. Where is the genetic information found in the cell?
   The nucleus.
3. How does the structure of a plant cell differ from that of an animal cell?
   A plant cell is larger and more rigid while animal cells are smaller, more malleable and fluid.
4. What can a plant cell do that no animal cell can? What plant-cell structure enables it to carry out this function?
   A plant cell can transform light energy from the sun into food energy. This is carried out by the chloroplasts.
5. What does DNA stand for? What does DNA do?
   Deoxyribonucleic acid. It provides all the instructions an organism needs to grow, function, and reproduce.
6. What are the 4 nitrogen bases that make up DNA?
   Adenosine, Thymine, Guanine and Cytosine.
7. What molecules make up the sides of the DNA strands?
   Phosphates and deoxyribose sugars (sugar-phosphate backbone).
8. What is cancer?
   Cancer is a group of cells with mutated DNA that do not know when to stop dividing. These cancerous cells can have very negative effects on surrounding body systems.
9. What are carcinogens? List the 3 types of carcinogens.
   Carcinogens are things that can cause cancer by damaging (mutating) DNA. They can be harmful chemicals such as those found in cigarette smoke, UV radiation from the sun, or viruses.
10. What is a tumour? Describe the difference between benign and malignant tumors.
    Tumours are groups of cancerous cells. Malignant tumours can spread while benign tumours do not spread.
11. What is cloning?
    Cloning is making another cell with the same DNA.
12. What is an enucleated cell?
    A cell that has had it's DNA removed.
13. Give the three main reasons why cell division is important?
    1) For growth and to increase number of cells.
    2) To replace dead cells and repair damage.
    3) For reproduction.
14. What is interphase?
    Interphase is the part of the cell cycle in between divisions when the cell grows, "does its job", and then gets ready to divide.
15. Why does the genetic material need to be duplicated during the cell cycle?
    So there is a copy to go to each of the new cells.
16. After mitosis, how do the daughter cells compare to the mother cell?
    Their DNA will be an exact copy.
17. List and describe the 4 phases of mitosis.
    Prophase – Chromosomes condense and the nucleus breaks down.
    Metaphase – Chromosomes line up across the middle of the cell.

Anaphase – Chromosomes split aprt.
Telophase – Chromosomes move to opposite ends and two new nuclei are formed.

18. In terms of chromosomes, how do female mammals differ from male mammals?
    The 23rd pair of chromosomes determine our sex – XX for females and XY for males.
19. A muscle cell from a mouse has 22 chromosomes. How many chromosomes would you expect in:
    a) An unfertilized egg cell? 11
    b) A zygote? 22
    c) A brain cell? 22
    d) A sperm cell? 11
20. What are somatic cells? What are reproductive cells? Somatic cells are "regular" cells which have the full number of chromosomes (diploid) and reproductive cells are sex cells like sperm and eggs which have half the full number of chromosomes (haploid).
21. What are homologous chromosomes?
    Homologous chromosomes are pairs of chromosomes that have DNA code for the same genetic trait. These chromosomes exchange DNA during meiosis (crossing over). This "shuffling of the deck" is why you and your siblings have differing traits from your parents.
22. Why is meiosis necessary?
    Meiosis is necessary because when sex cells (ex. sperm and eggs) combine, each must have half the regular number of chromosome number. For example, human sperm and eggs each have 23 chromosomes so when they combine, there will be a full 46 chromosomes again.
23. What is a diploid chromosome number? What is a haploid chromosome number?
    Diploid is the full number of chromosomes (ex. – 46 in human "regular" cells). Haploid is half the number of chromosomes (ex. – 23 in human sperm or eggs).
24. Use a Venn diagram to compare and contrast mitosis and meiosis.



25. What is nondisjunction? In what stage does nondisjunction occur?
    Nondisjunction is when chromosomes do not split evenly during anaphase, resulting in uneven numbers of chromosomes in each new cell.
26. If a zygote has 48 chromosomes, how many chromosomes would you expect to find in nerve cells as they develop? Why? There would also be 488 because only sex cells have a different number of chromosomes (half).
27. List 2 examples of genetic disorders caused by nondisjunction. Down syndrome has an extra 21st chromosome (47 in total) and Turner Syndrome has only one X chromosomes for the 23rd pair (45 in total). Also, Klinefilters syndrome is an extra X chromosome (47 in total).
28. In what type of chart are chromosomes arranged in to help determine if a fetus has a genetic disorder? A karyotype.

29. What are the advantages and disadvantages of asexual reproduction and sexual reproduction?

Asexual	Sexual
Advantages: • If organism is successful, an exact copy is good. • Less energy used finding a mate. • Process can be faster. Disadvantages: • No genetic variability means it's difficult to defend against changing environment (new viruses/diseases). • Less biodiversity. • Life cycles can be faster.	Advantages: • Genetic variability allows for advantageous traits to be passed on (survival of the fittest). • Defenses against viruses/disease will be passed on to next generation. • Allows for organisms to change according to their environment. • Many different organisms leads to rich biodiversity (think rainforest). Disadvantages: • More energy needed to find a mate. • Slower life cycle (rate of reproduction).

30. How is the zygote, produced by sexual reproduction, different from daughter cells, produced by asexual reproduction? The zygote is different because it is the fusion of DNA from two organisms (ex. Mom and Dad) which results in a genetically unique individual instead of an exact copy.
31. List 5 types of asexual reproduction.
    Binary fission, budding, fragmentation, spores, and vegetative reproduction. It is also asexual if a plant or animal is a hermaphrodite (makes both sperm/pollen and eggs) and fertilizes itself.
32. Identify the type of asexual reproduction in each of the following situation;
    a) Multicellular algae is struck by a wave. The algae breaks up and each new piece grew into a new organism. Fragmentation
    b) A new tree starts to grow from the root of a nearby tree. Vegetative growth
    c) A small cell begins to grow on the outside of another cell. Eventually, it breaks away from the larger cell and continues to grow. Budding
33. List and describe 3 types of sexual reproduction.
    1) Internal fertilization – sperm/pollen combines with the egg inside the female reproductive part.
    2) External fertilization – sperm/pollen combines with the egg externally (usually in water). Ex. Jellyfish in the ocean or fish/frogs in streams.
    3) Conjugation – some bacteria can "share" DNA creating genetically unique offspring.
34. What is a zygote?
    The cell created when a male sex cell fuses with a female sex cell. You when you were "one cell old"!
35. Explain external and internal fertilization.
    Internal fertilization – sperm/pollen combines with the egg inside the female reproductive part.
    External fertilization – sperm/pollen combines with the egg externally (usually in water). Ex. Jellyfish in the ocean or fish/frogs in streams.

36. Name the male and female parts of the flower. Male – stamens (consists of the filament and anther). Female – pistil (consists of the stigma, style, and ovary).

37. What is pollination? How is fruit formed?
Pollination is the fertilization of an egg by pollen. In flowering plants, the resulting zygote becomes a seed which is then surrounded by the sugary fruit to promote animals to eat them and disperse the seeds.

38. What is Robert Hooke Famous for? He was the first scientist to use the word "cell" as he compared the box-like cells of cork to the small cells that monks lived in (same shape as jail cells).

Topics on Reproduction Unit Test

- ✓ Parts of the cell
- ✓ Functions of each of these parts
- ✓ The cell theory
- ✓ The cell cycle
- ✓ Cell division (Mitosis)
- ✓ Phases of Mitosis
- ✓ Why cells divide?
- ✓ Formation of sex cells
- ✓ Nondisjunction
- ✓ DNA: The genetic Material
- ✓ The structure of DNA
- ✓ DNA Mutations and Cancer
- ✓ Cancer
- ✓ Parts of the flower
- ✓ Types of Asexual Reproduction
- ✓ Parts of the microscope

Key Terms

Asexual Reproduction
Binary Fission
Budding
Cancer
Carcinogen
Cytokinesis
Diploid
Fragmentation
Gene
Haploid
Mitosis
Organelle
Sexual Reproduction
Spore Formation
Variance
Vegetative Reproduction
Cell Division
Cloning
Conjugation
DNA
Egg
External Fertilization
Fertilization
Hermaphrodite
Internal Fertilization
DNA
Meiosis
Mutation
Nondisjunction
Anaphase
Cell Cycle
Genetic Screening
Interphase
Metaphase
Nucleus
Prophase
Reproductive Cells
Somatic Cells
Sperm
Telophase
Zygote
Cell Membrane
Cell Wall
Cellulose
Centriole
Chloroplasts
Chromosome
Cytoplasm
Endoplasmic Reticulum
Genetic Code
Golgi Bodies
Homologous Pairs
Karyotype
Lysosomes
Mitochondria
Nucleolus
Ribosomes
Vacuole

Do not forget to study quiz 1 & 2.

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Do not forget to study quiz #1 & your assignments!