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Unit VI  
Biology – Mitosis and Meiosis  
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# VI

## Cell Reproduction: Multiplication by Division

by *Kirstie Saltsman* from “Inside the Cell” pages 46 – 59

This book can be accessed online at <http://publications.nigms.nih.gov/insidethecell/chapter4.html>

Read Chapter 4 and answer the following questions about cell division.

- 1) Name the two kinds of cell division.
- 2) Describe the differences between these two types of cell division.
- 3) Give one example of cells that undergo mitosis.
- 4) Give one example of cells that undergo meiosis.
- 5) What is the purpose of mitosis?
- 6) What is the purpose of meiosis?
- 7) Mitosis only occupies a fraction of what is known as the cell \_\_\_\_\_.
- 8) The rest of the time is spent in \_\_\_\_\_.
- 9) List the three phases that occur during this longest period of a cell’s life.
- 10) Name two things that occur during the phase referred to in question #8.
- 11) Look at the picture on page 49 and list the two differences between this picture and the model you used for your flip book.

- 12) How does a cell know that one step in the cycle has been completed and it's time to move to the next one?
- 13) According to this text (refer to question #12) how many phases is mitosis divided into?
- 14) What is the primary goal of mitosis?
- 15) The text calls the chromosomes of the African globe lily enormous. How does their size compare to those of the longest human chromosome (hint: They're bigger is NOT the answer)?
- 16) What is one factor that causes a cell to send a "go" signal that causes cells to divide?
- 17) Name a factor that might cause cells to send a "stop" signal.
- 18) What occurs when either of these signals is sent at the wrong time?
- 19) What are some of the factors that can damage DNA and cause cancer?
- 20) How many pairs of chromosomes does the human cell contain?
- 21) What is the cell that results when an egg and a sperm combine called?
- 22) Why is meiosis a necessary process before reproduction of an organism can occur?
- 23) What does this book call the "director" of mitosis?
- 24) How does this "director" do its job?

- 25) What happens if the spindle makes a mistake during cell division?
  
- 26) The process of meiosis is to make \_\_\_\_\_ and \_\_\_\_\_ cells.
  
- 27) How many times during meiosis are the cells chromosomes copied?
  
- 28) How many times do the cells divide?
  
- 29) How long does it take for sperm to form in a human male?
  
- 30) How long does it take for a human egg to form in a female?
  
- 31) What happens during the process of meiosis in human eggs that causes Down syndrome?
  
- 32) What happens during meiosis that ensures that no two humans are exactly alike (not counting identical twins)?
  
- 33) How many different zygotes can a single set of parents produce (mathematically, that is).
  
- 34) What else can occur during meiosis that generates still more genetic variation?
  
- 35) What value does this genetic diversity have for the survival of a given species?

## Quiz

*Without referring back to the text or to the answers to the questions above, see if you can answer the following questions about cellular reproduction.*

1. Compare mitosis and meiosis in terms of their purpose and the type of cells in which each takes place.
2. Do cells divide during interphase?
3. What are cell cycle checkpoints, and why are they important?
4. Do most of our cells have one or two copies of each chromosome?
5. Describe two genetic processes that make each person unique.