



MITOSIS AND MEIOSIS

INTRODUCTION

Where do babies come from? How do living things grow and develop? Do cuts heal by magic? Well . . . Do you remember the Cell Theory? All these processes involve creating new cells, so perhaps the question should be where do the new cells come from? According to the Cell Theory, all cells arise from preexisting cells. The process of cells “arising” from preexisting cells is called cell division.

Cells live a life described by the cell cycle. In part of that cycle, the cell’s DNA is replicated (S phase of cell cycle). In another part of the cycle, the nucleus divides (that’s actually mitosis or meiosis), and the cell usually divides (cytokinesis) shortly after the nucleus divides. In this exercise, we’ll learn about mitosis, meiosis, and cytokinesis. We’ll learn about DNA replication in exercise five.

DISCUSSION

Mitosis is the more common and more basic of the two types of nuclear division. Mitosis produces somatic cells, not gametes. By the process of mitosis, one cell divides into two cells that are identical. They are also just like the one original cell from which they arose. Please spend as much time as you need to learn mitosis—it’ll make meiosis easier to learn. And if you know what happens in prophase, the rest of mitosis is easy!

Mitosis consists of four phases and, as an analogy, we can think of the whole process as being somewhat like moving to a new apartment.

1. Prophase

I like to think of this first phase as getting ready to move. You start by packing all your stuff into boxes—that’s like the chromatin condensing into chromosomes. The chromosomes are each two chromatids held together by a