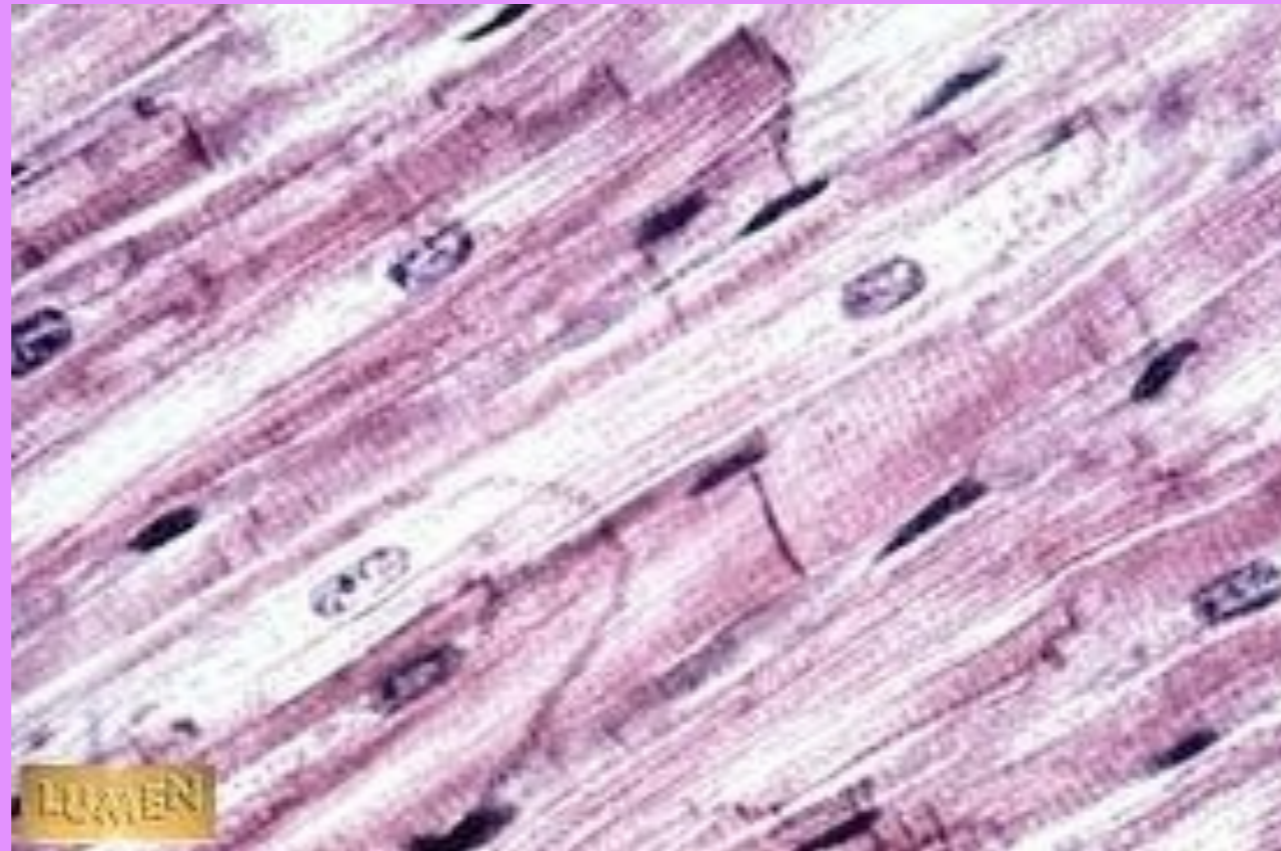

Mitosis



Mrs. Maxey

What is Mitosis?

What exactly is mitosis? It is a very important process for both plants and animals. Let's see just how important it is.

Mitosis - Cell Division

Goals

- 1. Describe how cells divide.**
- 2. Identify the importance of cell division.**

How did you become the size you are now? The cells of your body reproduced to increase the size of your body. The same is true for plants, as well. But how do cells reproduce?

The cells of your body are formed by cell division. Cell division has two major steps, but so much is going on before, during, and after those two big steps.

Basically, DNA in the nucleus is copied, and then the nucleus divides into two identical nuclei. Each new nucleus receives a copy of the DNA. Division of the nucleus is called mitosis.

Mitosis is the process that results in two new nuclei, each with the same genetic information. After mitosis has taken place, the rest of the cell divides into two new cells of about equal size.

Almost all cells in any plant or animal undergo mitosis. Mitosis is important because it provides the plant or animal with the growth it needs, but it also replaces aging, missing, or injured cells.

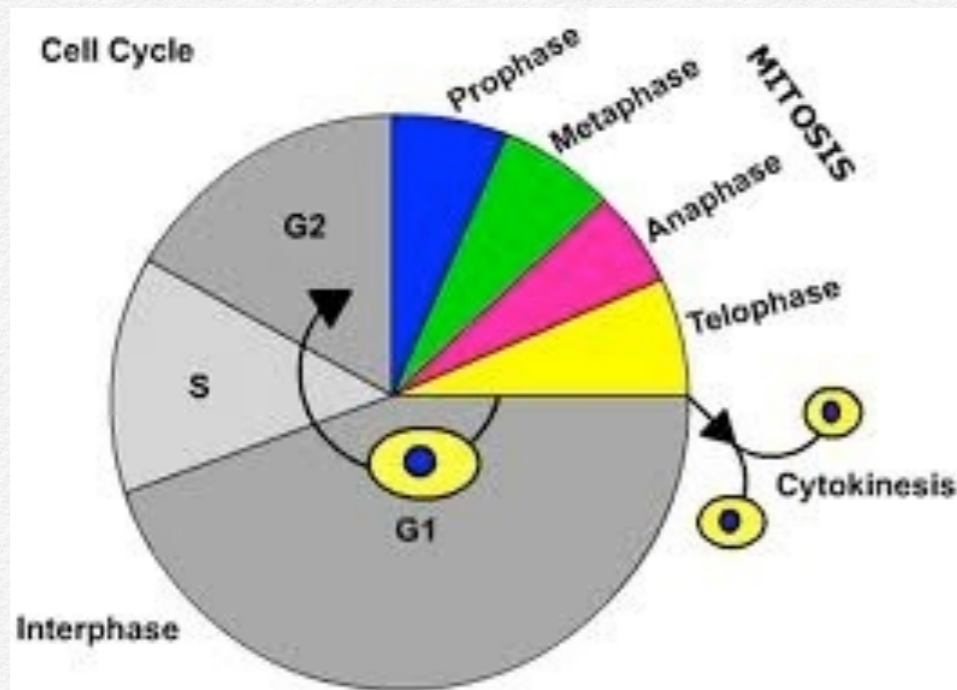
Without mitosis (cell division), plants and animals would struggle to survive. Now, it is time to look at the process of mitosis.

Before we begin, watch the video link below to get an overview of mitosis.

http://youtu.be/AhgRhXI7w_g

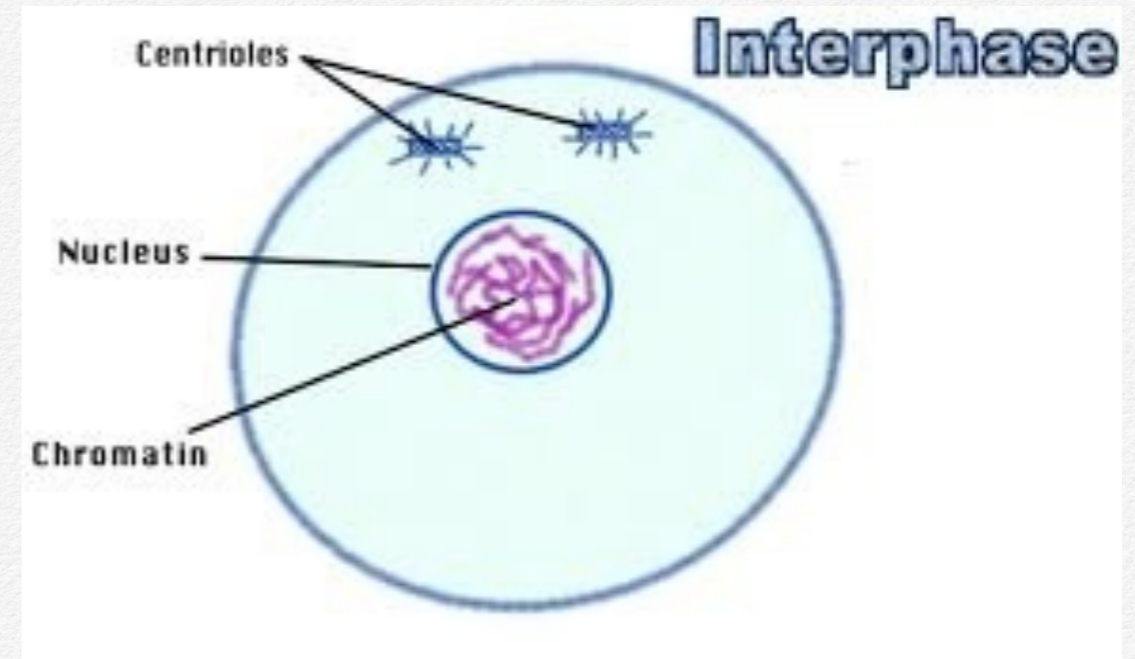
Now that you have previewed the phases of mitosis, let's look at each phase a little bit closer.

The cell division process itself is really quite short as you can see by the diagram below.



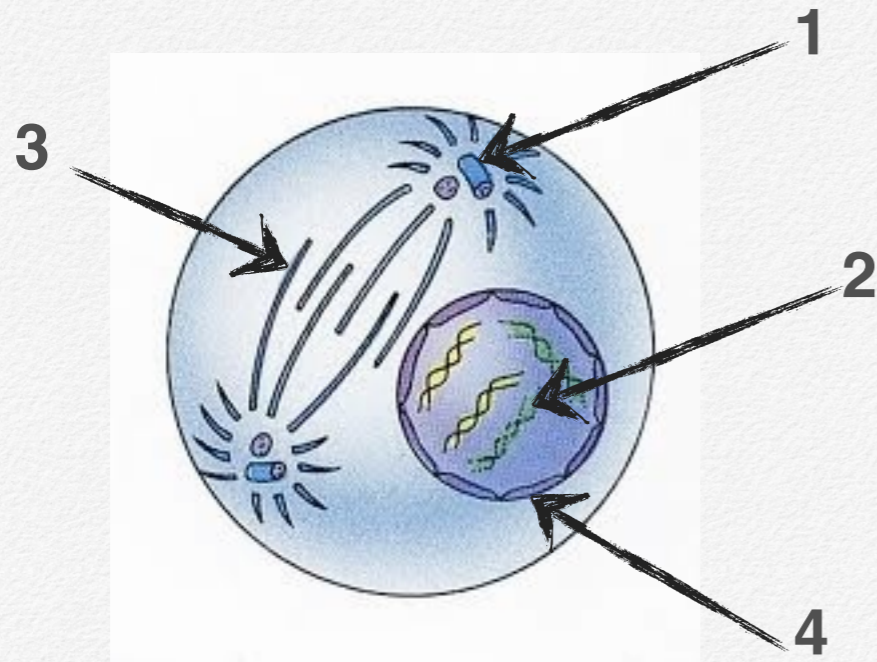
The cell cycle is spent mostly in the first phase, so let's start with the first phase, Interphase.

Interphase is where the cell is preparing itself for cell division. The cell is growing by producing proteins. The important part of interphase is that the chromosomes are duplicating during this phase. The chromosome pairs are not clear during this phase. They look like a ball of string or yarn. Interphase is the only phase where the chromosome pairs are not clearly seen.



A cell spends approximately 90% of its life in interphase.

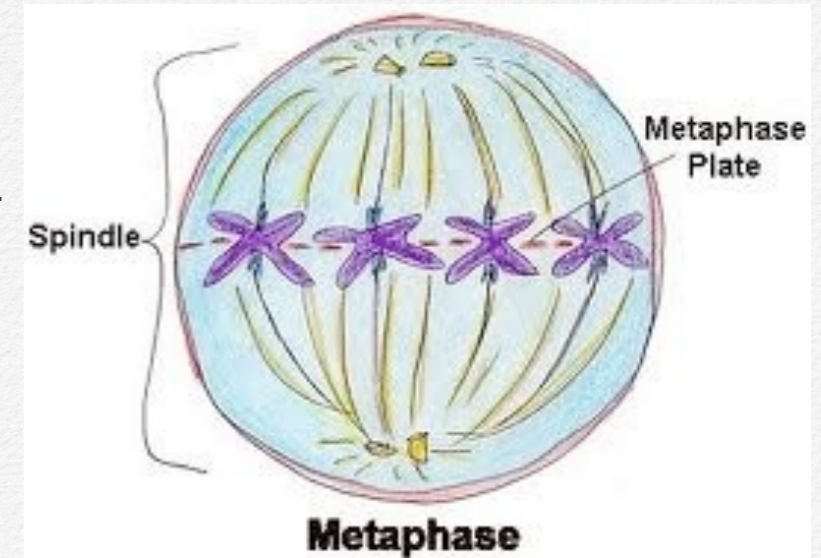
The cell division process begins with **Prophase**. So, now that the chromosomes were duplicated during interphase, the nucleus can begin to divide.



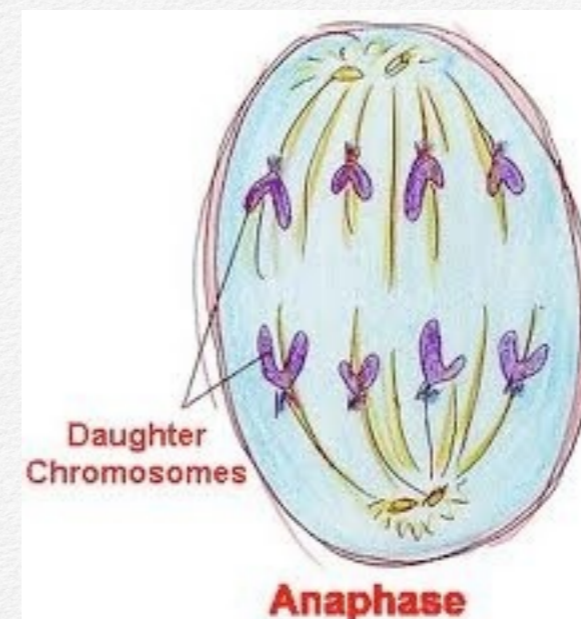
During prophase, (1) the centrioles begin to move to opposite ends of the cell. This is so the nucleus, and eventually the whole cell, can proceed with the division process. (2) Chromosome pairs are now clearly visible. (3) As the centrioles begin to move, spindle fibers appear. Spindle fibers will play a role in the next phase. (4) The nuclear membrane begins to disappear.

Following prophase is **Metaphase**.

During metaphase, the chromosome pairs line up in the middle of the cell along the metaphase plate as shown in the diagram above. The spindle fibers attach to the chromosome pairs.



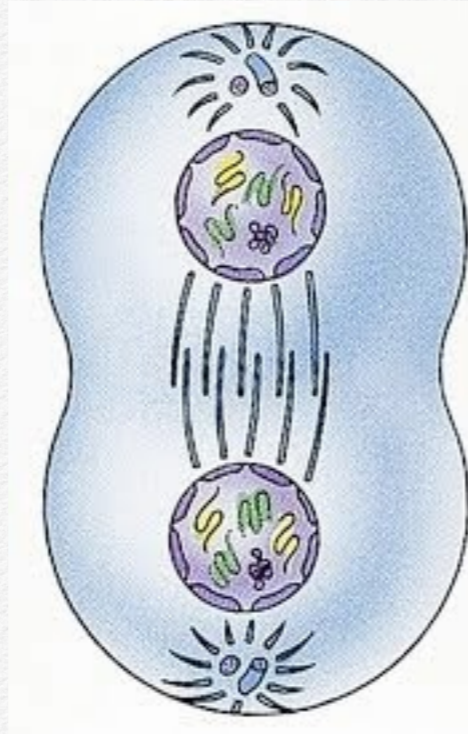
After metaphase comes **Anaphase**.



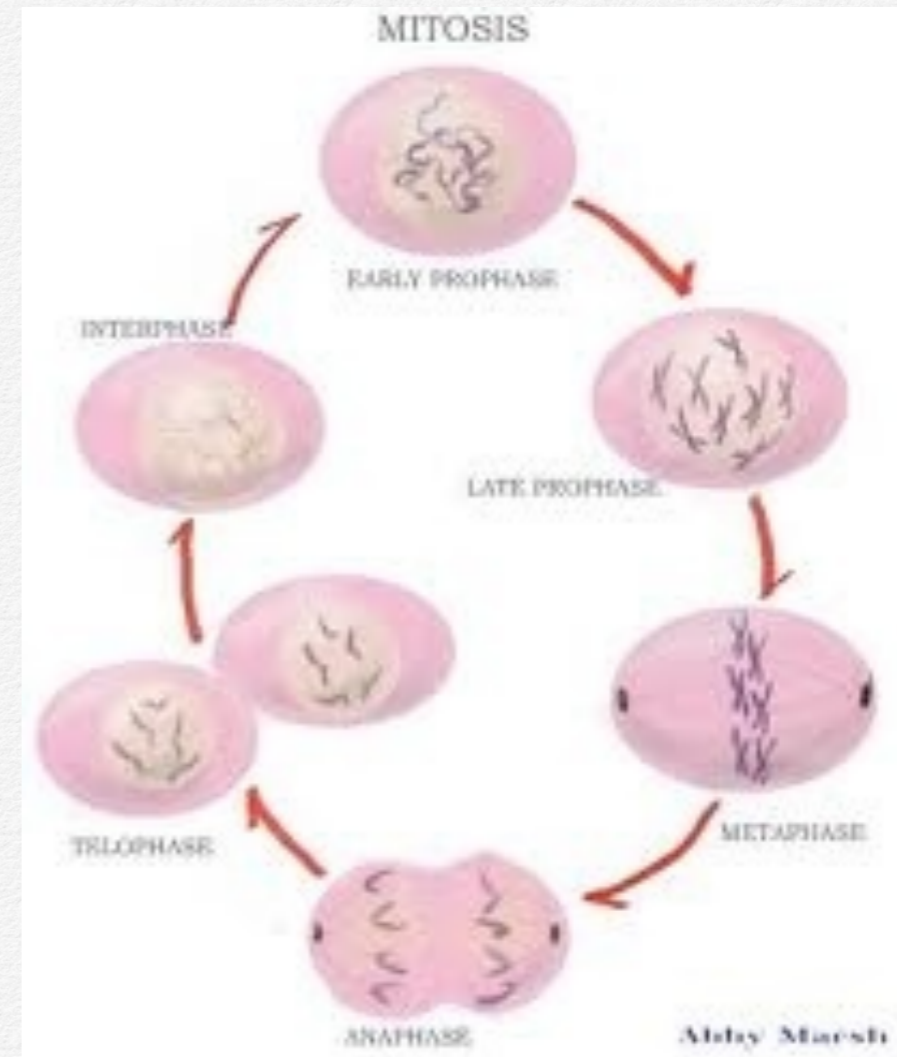
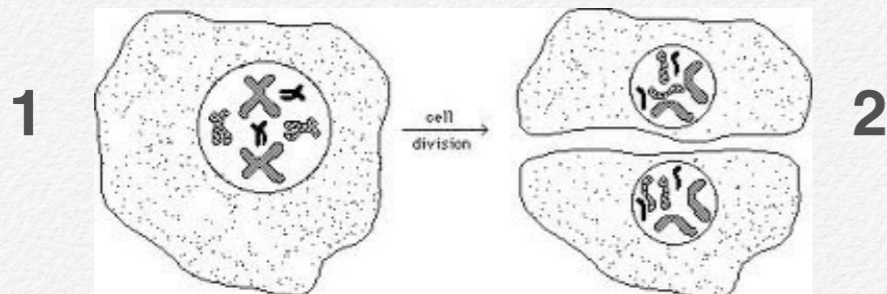
During anaphase, the pairs of chromosomes are pulled apart to opposite ends of the cell by the spindle fibers.

The final phase is **Telephase**.

Telephase is where the cell itself begins to divide. The two new nuclear membranes begin to form around the new nuclei in each cell. The cell begins to pinch in and the cytoplasm and the remaining organelles are divided as well. The final division process is called **cytokinesis**.



The end result of mitosis (cell division) is two new cells, called **daughter cells**, each identical to the original cell. Since the DNA was duplicated during interphase and it came from one cell, the two new cells (2) are identical to the original cell (1). If the original cell was a muscle cell, then the two new cells will be muscle cells. If the original cell was a leaf cell, the two new cells will be leaf cells.



Review

Practice Questions



REVIEW 2.1

During what phase does the cell spend most of its time?

- A.** Telephase
- B.** Anaphase
- C.** Metaphase
- D.** None of the above

Check Answer

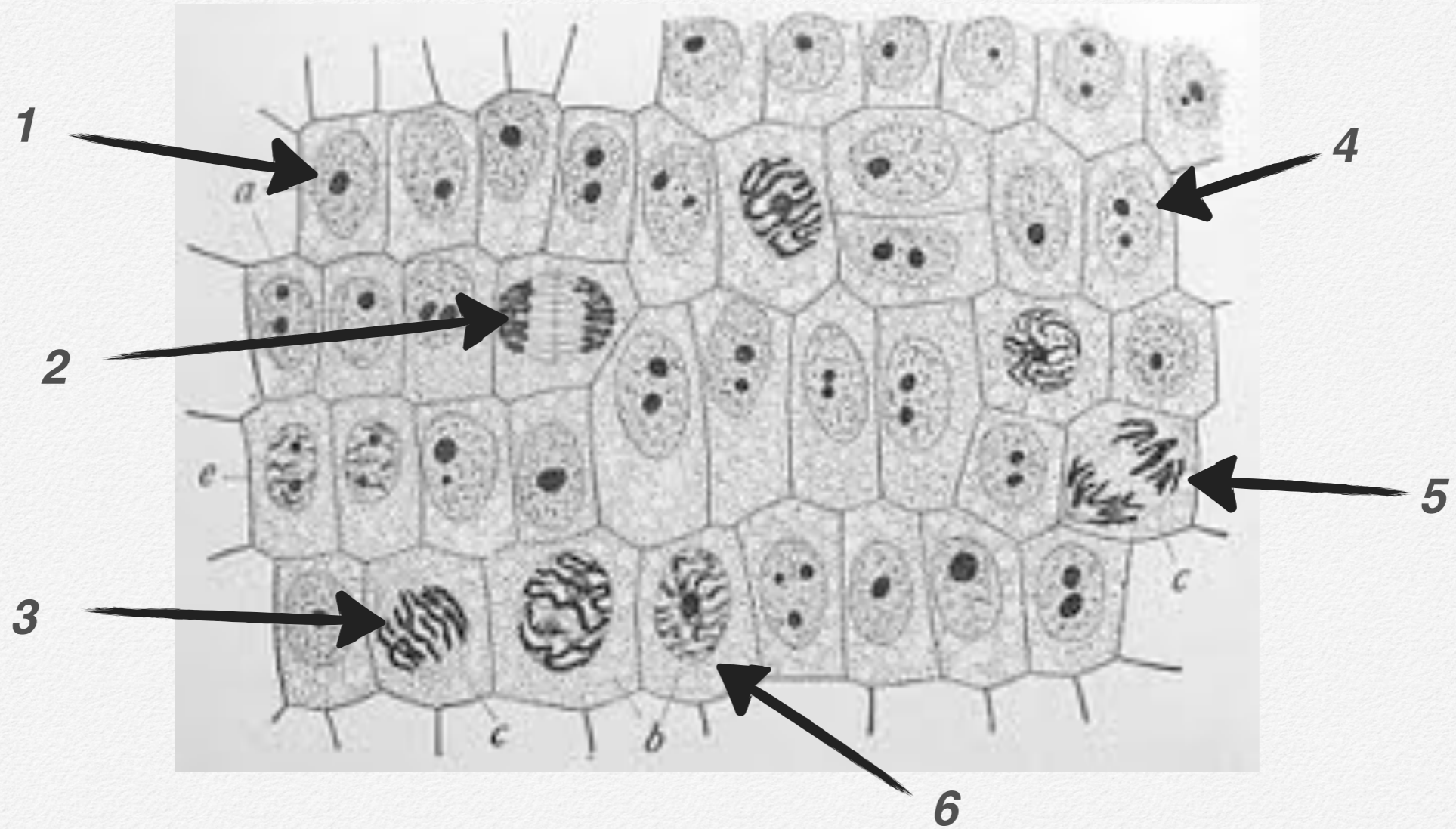
REVIEW 2.2

Cell division called mitosis is the division of the

- A.** chromosomes
- B.** cytoplasm
- C.** nucleus
- D.** cell

Check Answer

How many phases can you identify? Practice with the numbered cells, and then check your answers on the next page.



How many phases can you identify? Practice with the numbered cells, and then check your answers on the next page.

