Lesson 5.1: Critical Reading

Name_____ **Class**_____ **Date**_____

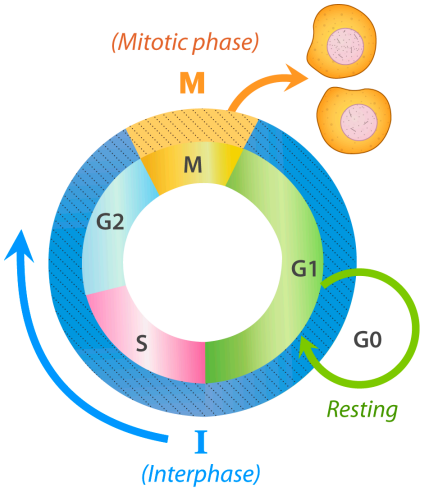
Read these passages from the text and answer the questions that follow.

The Cell Cycle

Cell division is just one of several stages that a cell goes through during its lifetime. The **cell cycle** is a repeating series of events, including growth, DNA synthesis, and cell division. The cell cycle in prokaryotes is quite simple: the cell grows, its DNA replicates, and the cell divides. In eukaryotes, the cell cycle is more complicated.

Eukaryotic Cell Cycle

The diagram in the figure below represents the cell cycle of a eukaryotic cell. As you can see, the eukaryotic cell cycle has several phases. The mitosis phase (M) actually includes both mitosis and cytokinesis. This is when the nucleus and then the cytoplasm divide. The other three phases (G1, S, and G2) are generally grouped together as **interphase**. During interphase, the cell grows, performs routine life processes, and prepares to divide. These phases are discussed below.



Eukaryotic Cell Cycle. This diagram represents the cell cycle in eukaryotes. The G1, S, and G2 phases make up interphase (I). The M phase includes mitosis and cytokinesis. After the M phase, two cells result. *(Image courtesy of CK-12 Foundation and under the Creative Commons license CC-BY-NC-SA 3.0.)*

Interphase

Interphase of the eukaryotic cell cycle can be subdivided into the following three phases, which are represented in the figure above:

- **Growth Phase 1 (G1):** During this phase, the cell grows rapidly, while performing routine metabolic processes. It also makes proteins needed for DNA replication and copies some of its organelles in preparation for cell division. A cell typically spends most of its life in this phase.
- **Synthesis Phase (S):** During this phase, the cell's DNA is copied in the process of DNA replication.
- **Growth Phase 2 (G2):** During this phase, the cell makes final preparations to divide. For example, it makes additional proteins and organelles.

Cancer and the Cell Cycle

Cancer is a disease that occurs when the cell cycle is no longer regulated. This may happen because a cell's DNA becomes damaged. Damage can occur because of exposure to hazards such as radiation or toxic chemicals. Cancerous cells generally divide much faster than normal cells. They may form a mass of

abnormal cells called a **tumor**. The rapidly dividing cells take up nutrients and space that normal cells need. This can damage tissues and organs and eventually lead to death.

Questions

1. What is the cell cycle?

2. What are the phases of the eukaryotic cell cycle?

3. In which phase does a cell spend most of its life? What happens during this phase?

4. What is cancer? What may cause cancer to occur?

5. What is the S phase? What happens during this phase?