

Section 1.2 Understanding the Cell Cycle - Answer Key

- 1) How did you begin your life? **I began life as a single cell.**
- 2) How many cells will your body be made of when you become an adult? **When I become an adult, my body will be made of hundreds of trillions cells.**
- 3) What is necessary for living organisms to grow and develop?
In order for organisms to grow and develop, cell division must occur.
- 4) What must each new cell have? **Each new cell must have a complete nucleus.**
- 5) What is the process that ensures that each new cell has a nucleus with a complete set of instructions (DNA) called? **The process is called mitosis.**
- 6) What must happen before mitosis can begin? **Before mitosis can begin, the nucleus must make a copy of its chromatin, so there are 2 sets of DNA.**
- 7) What is the process called in question 6? **The process in questions 6 is called replication.**
- 8) Replicated chromatin coils up to form what? **Replicated chromatin coils up to form double stranded chromosomes.**
- 9) What are chromosomes joined in the middle by? **Double stranded chromosomes are joined in the middle by a centromere.**
- 10) What has happened after replication? **After replication, two complete sets of DNA are bundled together as double-stranded chromosomes.**
- 11) Describe the phases of mitosis.
Prophase: The nuclear membrane disappears and spindle fibres begin to form.
Metaphase: Spindle fibres from the centrioles attach to the sister chromatids at the centromeres and line up in the middle of the cell.
Anaphase: The centromeres split and the spindle fibres pull the sister chromatids to opposite sides of the cell.
Telophase: The chromosomes gather at opposite sides of the cell and a nuclear membrane forms around each new group of chromosomes.
- 12) At the end of mitosis, there is still only **one** cell, but it now has **two** identical nuclei.
- 13) What happens in animals cells after the end of mitosis? **In animal cells, the cell membrane pinches the cytoplasm into two new cells.**
- 14) What happens in plant cells after the end of mitosis? **In plant cells, a cell plate develops across the centre of the cell, forming a new cell wall between the two new cells.**

15) What phase does a cell spend most of its time in? **The majority of a cell's time is spent during interphase.**

16) What does the prefix inter mean? **The prefix inter means "between".**

17) What happens during interphase? **During interphase, the cell grows, copies its DNA, and gets ready for the first phase of mitosis.**

18) What is the cell cycle? **The continuous process of mitosis, cell division, and interphase are called the cell cycle.**

19) Why must the nuclear membrane break down in mitosis?

The nuclear membrane has to break down in mitosis because the spindle fibres need to attach to the double stranded chromosomes and the DNA needs to replicate and split into two new cells.