Why Do Cells Divide?

* **To reproduce their own kind!**
* **This can be a single cell or a multicellular organism.**

{This is the ROLE of cell division}

**Hmmm…test question?**

**What is the Result of Cell Division?**

* **Cell division results in genetically identical daughter cells.**
* **Two Copies of DNA and organelles are made and distributed to each daughter cell.**

**{Good Thing to Know!}**

**What is the cell cycle?**

* **All the activities of a cell from its parent’s division to its own division.**

{Important definition?}

**The Cell Cycle**

**INTERPHASE**

**Synthesis Phase (S)**

**INTERPHASE**

**INTERPHASE**

**First Gap Phase (G1)**

**Second Gap Phase (G2)**

**Mitosis Phase/Cytokinesis (M)**

**G1 Phase**

* **Regular cell work**
* **Protein supply increases**
* **Cell grows in size**

{These are the key characteristics of the G1 Phase.}

**Hmmm…test question?**

S Phase

* **DNA Replicates**
* **Two identical copies of each DNA molecule are made**

{DNA REPLICATION IS THE PURPOSE OF THE SYNTHESIS PHASE.}

**My that’s interesting!**

**G2 PHASE**

* **Cell continues to grow before dividing.**

**{Good Thing to Know!}**

**INTERPHASE**

* **Interphase accounts for 90% of the cell cycle**
* **It includes the G1, S, and G2 Phases**

{Important information?}

**Mitosis**

* **The process a cell undergoes to divide the nucleus. The result are two new nuclei each with a set of chromosomes equal to the parent nucleus.**
* **Protein supply increases**
* **Cell grows in size**

{Looks like we have an important definition here!}

**Hmmm…Interesting!**

Prophase



* **Chromatin strands begin coiling more tightly.**
* **Each strand has an indentical twin called a sister chromatid.**
* **Identical sister chromatids join together at the centromere. These are the chromosomes.**
* **The mitotic spindle begins to form.**

**Prometaphase**

* **The nuclear envelope fragments.**
* **Microtubules extend from each centrosome to the middle of the cell.**
* **Some of the microtubules attach to the kinetochores of the chromosomes.**



**Metaphase**

* **The centrosomes are now at opposite ends of the cell.**
* **The chromosomes line up at the metaphase plate.**
* **Each sister chromatid has a kineticore that is attached to a microtubule coming from the centrosomes.**

 

**Anaphase**

* **The chromatids separate.**
* **Each of the chromosomes move towards opposite ends of the cell as the microtubules shorten.**
* **By the end of Anaphase, the two ends of the cell have equal and complete chromosomes.**

 

Telephase

* **Two daughter nuclei begin to form in the cell.**
* **Each form a nuclear envelope.**
* **The chromosomes become less condensed.**

 

**Cytokinesis**

* **In animal cells, cytokinesis involves the forming of a cleavage furrow.**
* **The cleavage furrow “pinches” the cell in two.**
* **The two new daughter cells are now formed and the cell cycle begins again.**



* **Regular Cell Work**
* **Protein Supply Increases**
* **Cell Grows in Size**
* **DNA Replicates**
* **Cell Continues to Grow Before Dividing**