

-3.7

-0.2

1. Chromosomes.

| | Shape | Number | Location | Divide By | Amount of Protein |
|-------------|---------------------------------------------|-----------------------------------------------|-----------------|-------------------------------------|----------------------|
| Prokaryotic | Twisted <u>loop</u> | 3,000 genes <i>one</i> | Membrane Plasma | Binary fusion | ? <i>very little</i> |
| Eukaryotic | Diffused mass of very long very thin fibers | 46 humans 100,000 genes <i>in pairs</i> | Nucleus | Cell cycle; mitosis and cytokinesis | ? <i>A lot</i> |

2. List three parts of interphase and briefly relate what is going on in each part.

Interphase is 90% of the time required for cell cycle.

G1, Is the gap between cell division and DNA Synthesis. This time is when the cell increases its supply of proteins, increases its organelles and grows in size. Also a holding spot in the control mechanism.

S Phase, DNA synthesis; each chromosome is single and at the end all are double. This is the replication phase.

G2, After the S phase and before the actual cell division.

3. List four phases of mitosis and the main events for each phase.

Prophase- Changes occur in both nucleus and cytoplasm. Within the nucleus chromatic fibers become more tightly coiled and folded. Within the cytoplasm the mitotic spindle begins to form as microtubules. Late in this phase the nuclear envelope breaks into fragments. Some of the microtubules attach to the kinetochores of the chromosomes.

Metaphase - The mitotic spindle is fully formed with the daughter chromatids attached to different poles at opposite ends of the cell. The centromeres of all the chromosomes are lined up on the metaphase plate.

Anaphase - Separation of the two sister chromatids. The daughter chromosomes walk up/down the microtubules to their perspective centrosomes. Spindle microtubules not attached to chromosomes continue to lengthen.

Telophase - The cell elongation continues. Daughter nuclei appear at the two poles of the cell as nuclear envelopes form around the chromosomes. The chromosomes start to uncoil and nucleoli reappear.

4. You have fallen in love with a person who has a younger brother with Down syndrome. What are its effects, and should you be concerned that