**“Cell Factory” assignment**

Instructions

1. (1 full page) Draw a typical eukaryotic (animal or plant) cell.
   1. On your drawing show the REAL NAMES of all the components & organelles listed in the 1st column below (there are 20). For very small items – such as mRNA, tRNA, ribosomes, etc. – you may draw them off to the side of the main cell structure, using ‘detail’ sketches. Incorporate COLOR other than just black and white, and TAKE PRIDE IN YOUR DRAWING.
   2. On your drawing, next to the ‘real names’, write in parentheses the ‘factory’ or ‘city’ names which you think are appropriate. Example: “Plasma membrane (international border)”. If you want, you can choose a different analogy, such as country, planet, school, cruise ship, etc.
2. (1 to 2 pages) Make a list of each of the 20 organelles or cell components below, using its REAL NAME, followed by a short paragraph explaining what it ACTUALLY DOES in the cell. You will need your textbook and the Internet for this! Research and explain them carefully.

Deliverables: you will turn-in 1) your drawing in all its GLORY, and 2) the real names with detailed descriptions of what they really do.

Grading (100 pts possible)

There are 20 cell components listed in the table. You will receive 2-1/2 points for each one shown on your drawing (50 points total), and 2-1/2 points for each one explained in your list (50 points total).

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| Real names of organelles and cell components | “Cell Factory” names | “Cell City” names |
| Plasma membrane | Factory fence or wall | International border |
| Transmembrane proteins | Guard shack or Security detail | Border crossing |
| Nucleus | Head office | City Hall |
| Nuclear membrane | Office security | City Hall fence/Police? |
| Nucleolus | CEO’s office | Mayor’s office |
| DNA | Parts list or blueprints | City planning dept. |
| mRNA (messenger RNA) | Post-It Notes or delivery orders | Blueprints |
| tRNA (transfer RNA) | Parts handling machines or ‘jigs’ | Construction workers? |
| Cytoplasm | Factory floor | Environment |
| Mitochondria | Power plant | Power plant |
| Chloroplasts (in plants) | Solar panels | Solar panels |
| Rough E.R. (endoplasmic reticulum) | Assembly area for proteins | Construction jobsite? |
| Smooth E.R. (endoplasmic reticulum) | Assembly area for lipids | Same as above? |
| Ribosomes | Two-part machine for proteins | Same as left? |
| Golgi Apparatus | Packaging & shipping dept. | Post Office or UPS/Fedex |
| Lysosomes | Janitorial dept. | Recycling plant |
| Vacuoles & vesicles | Shipping containers | Railroad car? |
| Centrosome | Road building dept. | Road building dept. |
| Microtubules | Highways | Highways |
| Motor proteins | Delivery truck | Locomotive? |