**“Cell Factory” assignment**

Background

The living cell is an amazing, complex factory on a molecular scale! A common exercise is to represent the cell as a factory or a city. This is an excellent way to visualize (and remember) what all the cell’s components do. Several examples are listed in the table, below, and you can find many other ideas on the Internet.

Include your name and date (3 pts), and submit as an email attachment. (100 points possible)

Instructions

1. Draw a typical human (animal) cell. Your drawing should fill an 8-1/2 x 11 page. Include the ACTUAL NAMES of all the components & organelles listed in the 1st column below. 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. Now in parentheses on your drawing, label all the parts with ‘factory’ or ‘city’ names which you think are appropriate. If you want, you can choose a different analogy, such as country, planet, school, cruise ship, etc.
3. (1 to 1-1/2 sheets, 11 font, 1.2 spacing) List each organelle and cell component using its ACTUAL NAME, and a short paragraph explaining what it actually does in the cell. You will need your TEXTBOOK and the INTERNET for this! Don’t GUESS at the functions. Research and explain them carefully.
4. Summary: you will turn-in your drawing in all its GLORY, plus 1 to 1-1/2 sheets of descriptions as directed in #3.

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| Actual names of organelles and cell components | “Cell Factory” names | “Cell City” names |
| Cell membrane | Fence | 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 |
| Endoplasmic reticulum | Assembly area or Shop floor | Construction jobsite? |
| Ribosomes | Work stations | Work benches |
| 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? |