

Answer key:**CELL CITY INTRODUCTION!**

Floating around in the cytoplasm are small structures called **organelles**. Like the organs in your own body, each one carries out a specific function necessary for the cell to survive. Imagine the cells as a miniature city. The organelles might represent companies, places, or parts of the city because they each have similar jobs.

Below are the descriptions of important parts of the Cell City:

<i>City Part</i>	<i>Function</i>	<i>Cell Part</i>
City Limits	Controls what goes in and out of the city	cell membrane
Road System	Allows for movement throughout the city	endoplasmic reticulum
City Hall	Controls all the activities in of the city	Nucleus
City Auditor	Stores all the records of the city and passes them on as the city grows	Chromosomes
City Planning Office	A place in the city hall where plans are made for the construction of the city	Nucleous
Construction Company	Builds structures for the city	Ribosomes
Delivery Van	Delivers products made at the construction company to other locations in the city	transport vesicle
Food Processing Plant	Processes large quantities of food entering the city into smaller packages that can be used more easily	Lysosomes
Warehouse	Stores materials needed by the city	Vacuole
Power Company	Produces energy for the city	Mitochondria
Solar Power Plant	Uses the sun's energy to produce power for the city	Chloroplast

As you move through this worksheet, see if you can match the important parts of the city listed above to the specific organelles found in cells. Be sure to write neatly, and in complete sentences.

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1. The *nucleus* is a large, round/oval structure usually located near the center of the cell. It is the control center for all the activities of the cell.
 - a. What company or place does the *nucleus* resemble in a Cell City?

City Hall

- b. Why do you think so?

The nucleus controls all of the activities of the cell as city hall controls all the activities in of the city.

2. The *cell membrane* is a thin, flexible envelope that surrounds the cell. It allows the cell to change shape and controls what goes into and out of the cell
 - a. What company or place does the *cell membrane* resemble in a Cell City?

City Limits

- b. Why do you think so?

The cell membrane controls what goes into and out of the cell as the city limits control what goes in and out of the city.

3. The *endoplasmic reticulum* consists of a network of a tube-like passageway that proteins from the ribosomes are transported through.
 - a. What company or place does the *endoplasmic reticulum* resemble in a Cell City?

Road System

- b. Why do you think so?

The endoplasmic reticulum consists of a network of a tube-like passageway through which proteins from the ribosomes are able to be moved within a cell as the road system allows for movement throughout the city.

4. The *ribosomes* are small grain-like bodies made mostly of RNA and produced in the nucleolus. Proteins are constructed at the ribosomes.
 - a. What company or place do the *ribosomes* resemble in a Cell City?

Construction Company

b. Why do you think so?

Proteins which are building blocks of cells are constructed at the ribosomes as are structures for the city are built by a construction company.

5. The jelly-like area between the nucleus and the cell membrane is called the *cytoplasm*. It helps organelles move throughout the cell.

a. What company or place does the *cytoplasm* resemble in a Cell City?

Waters flowing throughout Venice

b. Why do you think so?

The city of Venice is the only city of which I can think that has anything resembling a jelly-like area outside of city hall and within the city wall that helps specialized parts of a city move. That place would be the waters flowing throughout Venice. The waters via gondolas, waterbuses, or boats help transport persons and material within the city.

6. The *mitochondria* are tiny bean-shaped structures in the cytoplasm with a smooth outer membrane, and a greatly folded inner membrane. They supply the energy for the cell by transforming sugars into energy.

a. What company or place do the *mitochondria* resemble in a Cell City?

Power Company

b. Why do you think so?

The mitochondria supply the energy for the cell by transforming sugars into energy as does a power company produce energy for the city.

7. The *chromosomes* are rod-shaped bodies found in the nucleus. They are made of DNA and protein. They contain all the information to run the cell. They also pass on the hereditary traits of the cell to new cells.

a. What company or place do the *chromosomes* resemble in a Cell City?

City Auditor

b. Why do you think so?

The chromosomes contain all the information to run the cell and pass on the hereditary traits of the cell to new cells as does the city auditor stores all the

records of the city and passes them on as the city grows.

8. The *chloroplast* is an oval, green structure found in the cytoplasm. It contains chlorophyll. It captures the sun's energy and uses it to produce sugars in a process called photosynthesis.

a. What company or place does the *chloroplast* resemble in a Cell City?

Solar Power Plant

b. Why do you think so?

The chloroplast captures the sun's energy and uses it to produce sugars which is used to power a cell as a solar power plant uses the sun's energy to produce power for the city.

9. The *lysosomes* are small round structures found in the cytoplasm. They contain digestive enzymes that break down large food particles into sugars and other simple substances.

a. What company or place do the *lysosomes* resemble in a Cell City?

Food Processing Plant

b. Why do you think so?

The lysosomes contain digestive enzymes that break down large food particles into sugars and other simple substances that can be used more easily as does a food processing plant that processes large quantities of food entering the city into smaller packages that can be used more easily.

10. The *vacuole* is a large, round sac found in the cytoplasm. It stores water, food, wastes, or other materials needed by the cell.

a. What company or place does the *vacuole* resemble in a Cell City?

Warehouse

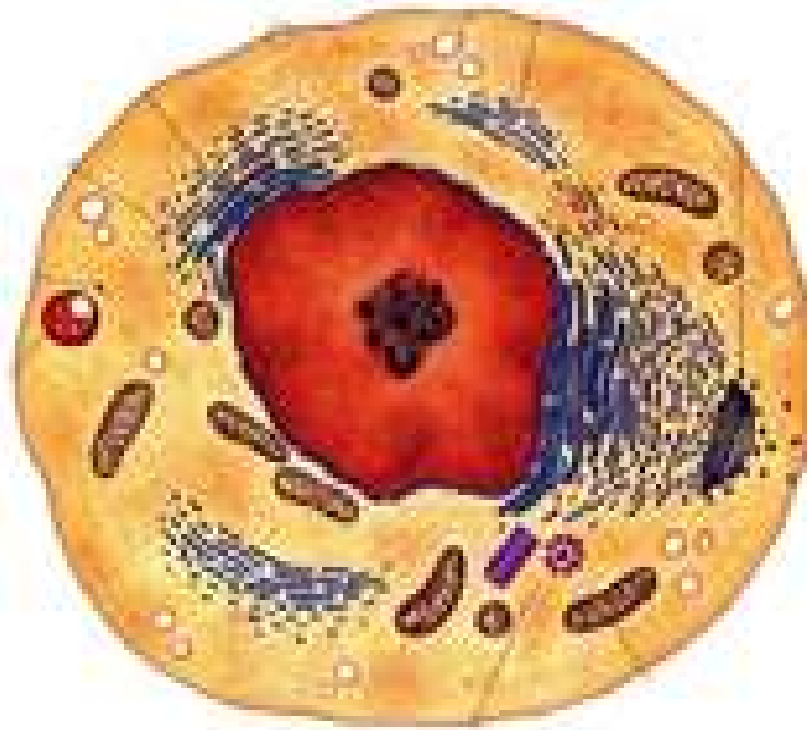
b. Why do you think so?

The vacuole stores water, food, and other materials needed by the cell like a warehouse stores materials needed by the city.

11. Now that you made the comparison between the parts of a city and the organelles of a cell, **draw out your city!**

- a. Make sure to label all 10 of the parts you identified in the Cell City, as well as which cell organelle they resemble.

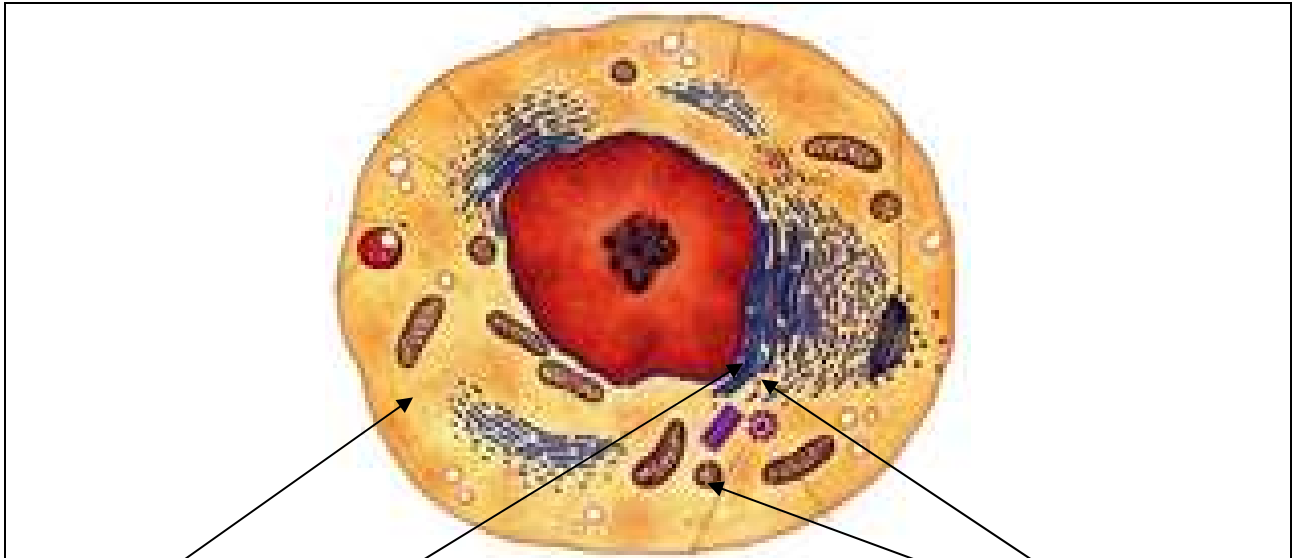
Go to Cells alive! for free use of interactive animal and plant cells at http://www.cellsalive.com/cells/cell_model.htm



Animal Cell Pictured Below

cell membrane
chloroplast (See plant cell below, not pictured here.)
chromosomes
nucleus

lysosomes
mitochondrion



cytoplasm

endoplasmic reticulum

ribosomes

vacuole

Picture retrieved September 16, 2010, from

<http://www.bing.com/images/search?q=animal+cell+picture&form=QBIR&qs=AS&sk=SQ2AS4&pq=animal+cell&sp=7&sc=8-11#focal=d85f74f74691016d47e9d2b41ef56894&furl=http%3A%2F%2Fmrscienceut.net%2FAnimalCell.jpg>

Plant Cell Pictured Below

cell membrane

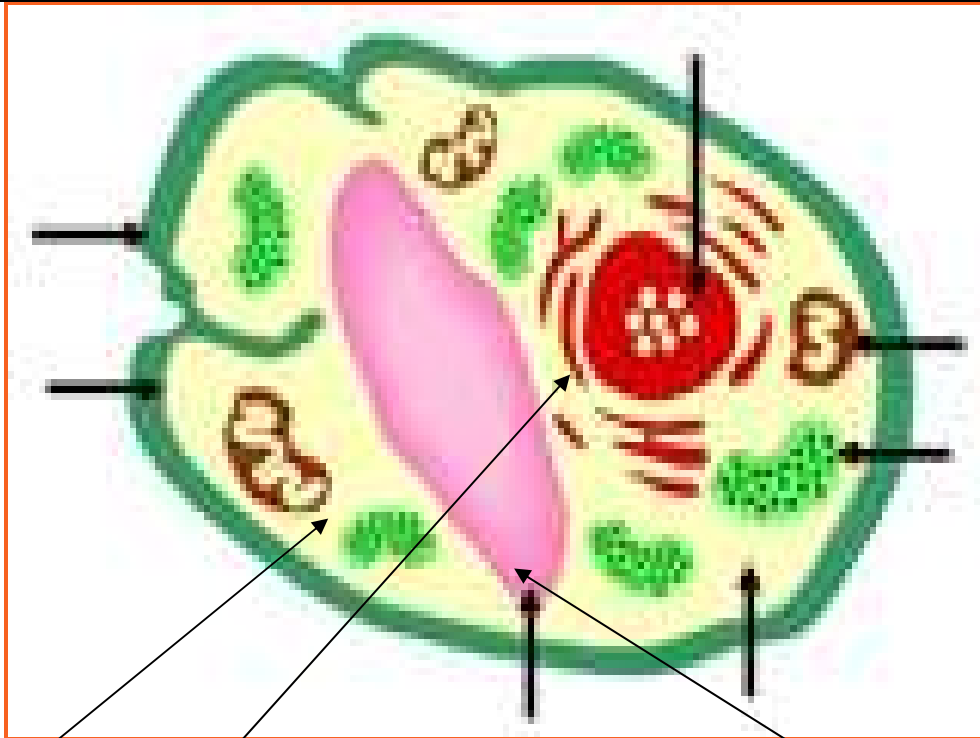
chloroplast

chromosomes (rod-shaped bodies in nucleus but not pictured below)

nucleus

lysosomes (not pictured below)

mitochondrion



cytoplasm

endoplasmic reticulum

ribosomes (not pictured here)

vacuole

Picture retrieved September 16, 2010, from

<http://www.bing.com/images/search?q=plant+cell+picture&form=QBIR&qs=n&sk=&sc=2->

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