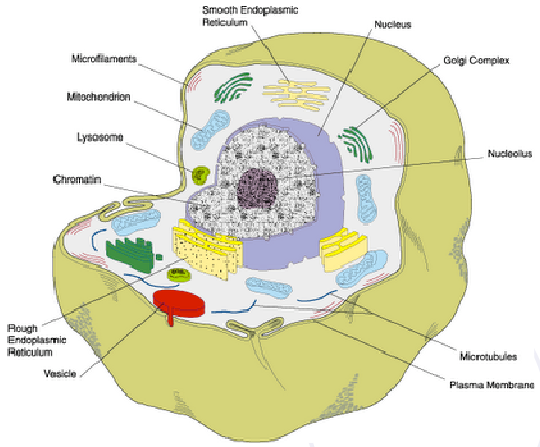


Cell Unit Review

Eighth grade 2008-2009 Volume 1, Issue 1

Main Ideas:

- Everything that is living is made of at least one cell.
- Cells are too small to see without a microscope.
- Every cell has parts—each of those parts has a special job that you need to know about.
- Your cells grow and divide all the time. The process is called the cell cycle.
- Your cells use respiration to change food into energy. They take oxygen and food and turn it into ATP, a molecule our cells use for energy.

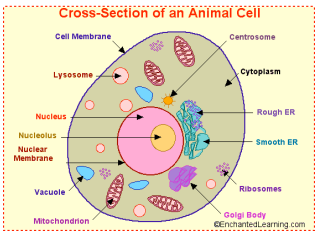
Inside this issue:

Parts of a Cell

Animal cells have ten different parts that you need to know about. Most animal cells are **eukaryotes**—this means that they have a nucleus. The **nucleus** is the control center of the cell. It is where our genetic information is stored. It also contains the **nucleolus**, which makes our ribosomes.

Eukaryotes also have other parts:

- **Ribosomes** are the parts of our cells that make proteins.
- **Endoplasmic reticulum** transports various materials throughout the cell.
- **Golgi bodies** package materials in the cell.
- The **mitochondria** are where respiration occurs. They change energy into a form that our body can use.
- The **cell membrane** is a phospholipid bilayer that protects the cell.



- The **lysosomes** clean up the wastes and old cell parts in our cells.
- The **vacuoles** are the storage facilities within our cells. Materials are held there until our body needs them somewhere else.
- The **cytoplasm** is the fluid within our cell. Fermentation occurs in the cytoplasm.

Animal cells need all of their parts to be working together to function correctly. Remember, cells are the basic unit of all living things. When our cells die, we die!

Cell Theory

Many scientists helped with the discovery of cells and to develop the cell theory. The cell theory has three parts.

1. All living things are made of one or more cells.
2. A cell is the basic unit of structure and function in living things.
3. All cells come from other living cells.

Robert Hooke was the first scientist to see cells, and he gave them their name. After Hooke made his discovery, **van Leeuwenhoek** saw blood cells and living organisms in pond water. Two scientists **(Matthias Schleiden** and **Theodor Schwann)** stated that all plants and animals are made of cells. Finally, **Rudolf Virchow** stated that all cells can be produced only by living cells.

The Cell Cycle: Interphase, Mitosis, and Cytokinesis

Our cells **reproduce** by growing and dividing. One **parent cell** makes a copy of itself and forms two identical **daughter cells**.

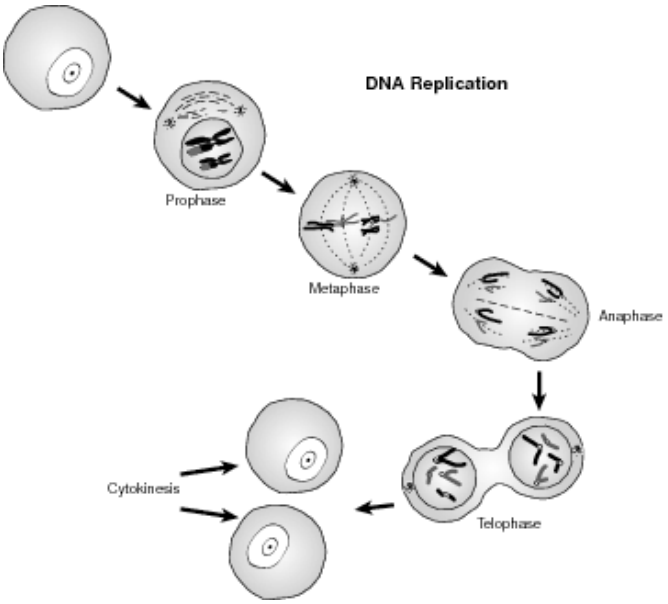
The cell cycle, which is the phases of interphase, mitosis, and cytokinesis, is a process that is happening all the time. Our cells are always growing and dividing.

During **interphase**, which is the longest phase of the cell cycle, the cell grows and makes copies of its chromosomes. These copies are called **sister chromatids**.

During **mitosis**, the cell's nucleus divides. Mitosis has four phrases.

1. **Prophase**: The nuclear membrane breaks down and **spindle fibers** attach to the sister chromatids.
2. **Metaphase**: The sister chromatids meet in the middle of the cell.
3. **Anaphase:** The spindle fibers pull apart the sister chromatids. Each sister chromatid is an exact duplicate of the parent cell's DNA.
4. **Telophase:** The spindle fibers disappear and the new nuclei forms.

During **cytokinesis,** the cytoplasm divides, and we finally have two cells with a complete set of chromosomes.



Cellular Respiration

When we eat, our bodies have to change food into a form that they can use.

When our body has oxygen to use, it takes the oxygen and the food molecules we have eaten. A chemical reaction occurs in a cell's mitochondria. This chemical reaction converts these ingredients into **ATP**, the molecule that our body uses for energy, and carbon dioxide.

However, our body doesn't always have enough oxygen. Sometimes we work out too hard, and our body has trouble getting all the oxygen that it needs. When this happens, our body has to undergo a process called **fermentation** instead. Fermentation is another way our body can make ATP in the cytoplasm of our cells. However, our body would prefer to do respiration because it makes more energy

Our bodies' cells undergo lots of different processes to make sure that our bodies stay healthy and work the way they should.

Other Cell Processes

Homeostasis: Our body must maintain a stable internal (inside) environment. That means that a cell needs to keep its temperature about the same. It also needs to keep its levels of nutrients and water about the same. This balance inside our body is called **homeostasis**.

Meiosis: Our gametes (sex cells) also reproduce. This process is called meiosis.

Passive transport:: Our cells move molecules across the cell membranein a few ways. If the cell does not use energy to move the molecules, we call it **passive transport**. The molecules are moving from areas of high concentration to areas of low concentration. We call this **diffusion** unless water is doing the moving—then we call it **osmosis.**

Active transport: When our cells use energy to move molecules from an area of low concentration to an area of high concentration, we call it **active transport.**

Inside Story Headline

This story can fit 150-200 words.

One benefit of using your newsletter as a promotional tool is that you can reuse content from other marketing materials, such as press releases, market studies, and reports.

While your main goal of distributing a newsletter might be to sell your product or service, the key to a successful newsletter is making it useful to your readers.

A great way to add useful content to your newsletter is to develop and write your own articles, or include a calendar of upcoming events or a special offer that promotes a new product.

You can also research articles or find "filler" articles by accessing the World Wide Web. You can write about a variety of topics but try to keep your articles short.

Much of the content you put in your newsletter can also be used for your Web site. Microsoft Publisher offers a simple way to convert your newsletter to a Web publication. So, when you're finished writing your newsletter, convert it to a Web site and post it.

Caption describing picture or graphic.

Inside Story Headline

This story can fit 100-150 words.

The subject matter that appears in newsletters is virtually endless. You can include stories that focus on current technologies or innovations in your field.

You may also want to note business or economic trends, or make predictions for your customers or clients.

If the newsletter is distributed internally, you might comment upon new procedures or improvements to the business. Sales figures or earnings will show how your business is growing.

Some newsletters include a column that is updated every issue, for instance, an advice column, a book review, a letter from the president, or an editorial. You can also profile new employees or top customers or vendors.

"To catch the reader's attention, place an interesting sentence or quote from the story here."

Inside Story Headline

This story can fit 75-125 words.

Selecting pictures or graphics is an important part of adding content to your newsletter.

Think about your article and ask yourself if the picture supports or enhances the message you're trying to convey. Avoid selecting images that appear to be out of context.

Microsoft Publisher includes thousands of clip art images from which you can choose and import into your newsletter. There are also several tools you can use to draw shapes and symbols.

Caption describing picture or graphic.

Once you have chosen an image, place it close to the article. Be sure to place the caption of the image near the image.

Organization

Primary Business Address
Your Address Line 2
Your Address Line 3
Your Address Line 4

Phone: 555-555-5555
Fax: 555-555-5555
E-mail:
someone@example.com

Your business tag line here.

WE'RE ON THE WEB!

EXAMPLE.MICROSOFT.COM

This would be a good place to insert a short paragraph about your organization. It might include the purpose of the organization, its mission, founding date, and a brief history. You could also include a brief list of the types of products, services, or programs your organization offers, the geographic area covered (for example, western U.S. or European markets), and a profile of the types of customers or members served.

It would also be useful to include a contact name for readers who want more information about the organization.

Back Page Story Headline

This story can fit 175-225 words.

If your newsletter is folded and mailed, this story will appear on the back. So, it's a good idea to make it easy to read at a glance.

A question and answer session is a good way to quickly capture the attention of readers. You can either compile questions that you've received since the last edition or you can summarize some generic questions that are frequently asked about your organization.

A listing of names and titles of managers in your organization is a good way to give your newsletter a personal touch. If your organization is small, you may want to list the names of all employees.

If you have any prices of standard products or services, you can include a listing of those here. You may want to refer your readers to any other forms of communication that you've created for your organization.

You can also use this space to remind readers to mark their calendars for a regular event, such as a breakfast meeting for vendors every third Tuesday of the month, or a biannual charity auction.

If space is available, this is a good place to insert a clip art

Caption describing picture or graphic.

image or some other graphic.