Cells: Building Blocks of Living Things
by Cindy Sherwood

To build a tower of blocks, you put one block on top of another until it creates a tall structure. With living things, there is a type of building block that does the same thing, creating the structure of who we are. This building block of all living things is called a cell.

A cell that is cut in half will not survive. That makes a cell very special. It is considered the smallest part of an organism that can survive on its own, so it is the most basic unit of life.

Trillions of cells join together to form a human being. But a single cell can also be alive. There are many very simple single-celled organisms, such as bacteria. They are the earliest and most primitive forms of life on earth.

Cells are extremely tiny. Even if you have perfect eyesight, you cannot see one, except with a microscope. So what does a cell look like? Imagine a kind of sack holding a watery, jelly-like material. The sack is held together by a membrane, the outer lining of the cell. This membrane separates one cell from others and protects it from its outside environment. The membrane also allows some materials to enter and leave the cell.

There are many different types of cells, which serve different purposes in how plants and animals function. There are cells that take in nutrients from food and other cells that turn those nutrients into energy. Some cells provide structure to an organism. Other cells can make copies of themselves. Certain types of cells contain organelles. Just like the name sounds, organelles are similar to small organs of the human body and perform specific tasks necessary for an organism to survive.
A human being may live to be a hundred years or older. But that does not mean all of our cells live that long. In fact, depending on the type of cell, some only live for a few days while others may live as long as a year. In fact, every single minute, about 300 million cells die in your body. But there is no need to worry you will run out of cells because so many die all the time. About 300 billion new cells are produced every day in the human body!

Another amazing aspect of cells is that they contain all the genetic material that helps determine who you are when you are born, such as your hair, eye, and skin color and whether you will grow up to be tall or short. Human cells contain 23 pairs of chromosomes with this genetic information. One pair of these chromosomes, which are known as the X and Y chromosomes, even determine if you are born as a boy or girl. Who could imagine that something as tiny as a cell could be so important to all of life!
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1. What would you find inside a human cell if you could inspect it closely?
   a. smaller living organisms  
   b. genetic material  
   c. bacteria  
   d. smaller cells

2. According to the information in the article, will a human being have the same set of cells that he or she is born with when he or she is old? Why or why not?

3. Read the following statement.

   "Cells cannot survive without the support of other cells."

   On the lines below, indicate whether this statement is true or false. Then explain why the statement is true, or why it is false.

4. In your own words, describe what some of the earliest life forms were like.

5. According to the information in the article, what does the membrane of a cell do?
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The following terms are vocabulary words from the article. Match the vocabulary word with its correct definition by writing the corresponding letter on the line.

1. ___ genetic
   a. threadlike structures inside cells that carry genetic materials

2. ___ primitive
   b. an instrument that allows you to look closely at objects that are invisible to the human eye, including cells

3. ___ organelles
   c. remain alive

4. ___ chromosomes
   d. relating to genes; hereditary information that is passed from parent to child

5. ___ nutrients
   e. single-celled organisms that can cause some diseases

6. ___ microscope
   f. any specialized structures inside a cell that perform specific tasks; similar to organs

7. ___ organism
   g. the strength a living thing gains from absorbing nutrients

8. ___ bacteria
   h. ancient; prehistoric

9. ___ survive
   i. substances that provide the nourishment living things need to survive and grow

10. ___ energy
    j. an animal, plant, or single-celled living thing
In the article, “Cells: Building Blocks of Living Things,” you learned that a cell is the most basic unit of life. Trillions of cells make up the human body, and each one has a special function that helps the body run smoothly.

Using the information in the article, and your science textbook, describe three different types of cells in the human body. Make sure you share the name of the cell, describe its function in the body, and provide any other interesting facts you find about that type of cell.
Rhinoceros Beetle
By Guy Belleranti

Have you ever seen a rhinoceros at the zoo? A rhino is a large, strong animal, which is famous for its distinctive horns. There is also an insect with similar characteristics - it's very large, very strong, and even has horns! It's the rhinoceros beetle.

There are many species of rhinoceros beetles. The strongest is the Hercules rhinoceros beetle which can lift up to 850 times its own weight. That would be like you lifting 850 people your size! This makes the Hercules rhinoceros beetle the strongest animal on Earth! Relative to its size, it's even stronger than a bear, a lion, or an elephant.

The male rhinoceros beetle has two horns and looks a bit like a rhinoceros. One horn is on the top of its head. The other horn comes off the thorax (the area between the head and the abdomen). Females have no horns.

The male beetles even have duels. They sometimes lock horns with each other. They will try to push each other and even flip each other over. When they're not duelling, rhinoceros beetles use their horns to dig through leaf litter in search of food.

Many male rhinoceros beetles are over 2½ inches long, however Hercules rhinoceros beetles can be over 6 inches long!

The rhinoceros beetle's size and fearsome appearance help protect it from predators. It will also hiss and squeak if it feels threatened. These squeaks
aren’t made by its mouth. Instead, they are made by rubbing wings against abdomen.

During the day, this big beetle hides under logs and other vegetation. At night, it comes out to look for food. It’s favorite foods include plant sap, nectar, fruit, and decaying plants.

Rhinoceros beetles live on every continent except Antarctica. Most of the largest species, like the Hercules beetle and the elephant beetle, live in warm, tropical regions. Some smaller species, such as the unicorn beetle and Grant’s beetle, live in the United States.

Like other insects rhinoceros beetles have wings. And yes, despite their large size, they can fly quite well.

Although this insect might look a little scary it really is harmless to humans. It doesn’t sting or bite. Some people even keep them as pets.

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**About the Author**

Guy Belleranti works as a docent at Reid Park Zoo in Tucson, Arizona. The information in this article comes from his experiences working with wild animals and teaching others.
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1. List three ways mentioned in the article that rhinoceroses and rhinoceros beetles are alike.

   -
   -
   -

2. What can you determine about the rhinoceros beetle in the picture to the right?
   a. It has eight legs.
   b. It can’t fly.
   c. It is male.
   d. It is poisonous.

3. Of course, a lion, bear, or elephant could crush a rhinoceros beetle. However, the article says that the rhinoceros beetle is “the strongest animal on Earth.” How can this be?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

4. What do rhinoceros beetles eat?

   ____________________________________________________________

5. Are rhinoceros beetles herbivores, carnivores, or omnivores?

   ____________________________________________________________
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The scrambled words below are vocabulary words from the article. Unscramble each word and write it on the line. Please be sure each word is spelled correctly.

1. ____________  
   coserinoehr
   hint: large mammal with horns

2. ____________  
   oartxh
   hint: middle part of an insect's body

3. ____________  
   arefseom
   hint: frightening

4. ____________  
   akuesq
   hint: A short, high-pitched sound

5. ____________  
   iaveegotttn
   hint: plant life

6. ____________  
   mIheassr
   hint: antonym for dangerous

7. ____________  
   aricoptl
   hint: from a hot and humid place
A-Maze-ing Layers of the Earth

First: Find your way through the maze by connecting letters to spell out the four main layers of the earth (named in order from outside to inside).

CRUST  MANTLE
OUTER CORE  INNER CORE

You may move forward, backward, up, or down, but no letter may be connected more than once.

Second: Write the remaining unconnected letters in the blank spaces to learn two interesting facts about the earth.

Write the unused letters on the lines to reveal two interesting facts about the earth.

__________________________
__________________________
__________________________
__________________________
__________________________
__________________________
__________________________
__________________________