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**Title:** SECTION 3: RESPIRATION IN THE BODY CELLS.

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**Abstract:** This article describes cellular respiration. The process uses oxygen to release chemical energy stored in foods. Energy is released a little at a time and stored in chemical packets called ATP. Carbon dioxide is a dangerous waste product for the cell. Blood carries carbon dioxide wastes back to the lungs. (Copyright applies to all Abstracts)

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### SECTION 3: RESPIRATION IN THE BODY CELLS

Right now thousands of chemical reactions are going on inside the cells of your body. These reactions are helping you to sit up, move your eyes across the page, think about what you are reading, and do many other things. All these activities require energy which the body gets from chemical energy stored in foods. But oxygen is needed to release food energy, in a process called cellular respiration.

In a way, cellular respiration is very much like burning. When you light a campfire, you need fuel to burn. But you also need air to keep it going. If you covered the fire with a glass dome so that no new air could get to it, the fire would quickly go out.

In a fire, fuel is combined with oxygen to release energy in the form of heat and light. The sticks and dry leaves burned in a campfire are converted to carbon dioxide or another product, carbon monoxide. But the fuel does not burn completely; part of it is left as black charcoal, which is carbon.

Cellular respiration uses fuel much more efficiently than a campfire. In a complicated series of steps, energy is released a little at a time and stored in chemical packets called ATP. No light is produced, and only a little energy is "wasted" as heat, which helps to keep the body warm. And no charcoal is left; all of the carbon is converted to carbon dioxide.

Carbon dioxide is a dangerous waste product for the cell. Too much can poison it. That is why the other part of the gas exchange is needed, and the blood carries carbon dioxide wastes back to the lungs to be exhaled. So it is not surprising that carbon dioxide, not oxygen, is the signal that stimulates the breathing center.

The tissues of the brain and muscles are especially big energy consumers, so they need

large supplies of food materials and oxygen. These tissues have a rich supply of capillaries to bring them the materials they need.

PHOTO (COLOR): Sharks breathe by means visible here as series of slits in the sides of the shark.

PHOTO (COLOR): A tadpole breathes through gills until it becomes a frog, when it develops lungs.

DIAGRAM: The respiratory system of a frog

PHOTO (COLOR): Antoine Laurent Lavoisier

PHOTO (BLACK & WHITE): John Haldane

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By Alvin Silverstein, Dr.; Virginia Silverstein and Robert Silverstein

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**Source:** Respiratory System (9780805028317)