**CHEMISTRY READING #2: If Mass is Conserved, What Happens When You Lose Weight?**

**STEP 1: Read AND ANNOTATE the following article.**

# When you lose weight, where does it go?

December 18, 2006

**Lora A. Sporny, adjunct associate professor of nutrition education at Columbia University, answers.**

In order to understand the disappearance of body fat, we must enter the world of biochemistry. All fats, whether solid or liquid, exist in chemicals, which consist of a glycerol molecule and three fatty acid chains. These chemicals are called macromolecules. Each macromolecule's appearance is similar to the letter "E"--with the glycerol being the vertical line and the fatty acids as the three horizontal lines. Many of these macromolecules are stored as droplets of oil within the fat cells that make up the fat tissue located throughout the body. They represent a fuel source to support bodily activities; very much like gasoline fuels a car.

People who are overweight or obese possess large fat cells brimming with this fuel. When trimming calories and/or increasing exercise during weight loss, the enzyme hormone, located within fat cells, responds to messages and breaks apart triglycerides into their component glycerol and fatty acids. These components then slip out of the fat cells and into the bloodstream, where they are accessible to tissues throughout the body. The liver tends to absorb the glycerol and some of the fatty acids while the remainder is taken in by the muscles.

Once inside liver or muscle cells, the triglyceride ingredients are further broken apart and modified, eventually resulting in large quantities of a different compound. Within the cells' mitochondria--the power source of the cells--the new compound combines with another compound to form citric acid. This synthesis reaction kicks off the citric acid cycle, a set of chemical reactions that creates usable energy from fat, protein and carbohydrates. As these activities unfold, they generate carbon dioxide, water and heat, as well as adenosine triphosphate (ATP), an energy-carrying molecule that fuels cellular activities.

The carbon dioxide is then expelled from the lungs during exhalation. The water exits the body as urine and perspiration. The heat that is generated helps to maintain body temperature at a comfortable 98.6 degrees Fahrenheit. And the ATP powers cellular activities that require energy--from moving your muscles during exercise, to maintaining your heart's 100,000-plus beats each day, to digesting each mouthful of food that you swallow and processing nutrients into bodily tissues.

**STEP 2: SUMMARY**

In one paragraph, write a summary of what this article discussed. Your summary should include the title, author, date and source of the article. This paragraph should also include **who the author is and what their job is, the main idea of the article is, what the supporting evidence is, and why the topic is important to the average individual**.

**STEP 3: REFLECTION**

In a second paragraph, write a reflection focused on your thoughts and opinions on what you just read. Your reflection could (but does not have to) answer the following questions:

* What is your initial reaction to this article?
* What opinions do you have about what was discussed in this article?
* What information surprised you in this article? What did you learn from this article that you didn’t know before?
* What connection can you draw between this article and yourself or something else you have learned?
* What next steps could scientists take with what they have learned in this article?