**MATTER AND ENERGY: What are they? Can matter be turned into energy?**

**MATTER** is defined as *“anything that has mass and takes up space”*. Matter makes up the universe, and of course, all living things as well. Matter is made up of particles called **atoms**. The bodies of organisms are composed mainly of atoms of **C** (carbon), **H** (hydrogen), **O** (oxygen), and **N** (nitrogen) organized into molecules called **fats**, **proteins**, and **carbohydrates**.

**ENERGY** is different from matter. Energy does not have mass, nor does it take up space. Energy is harder to define, but can be understood as *“the ability to change or cause change”.* Energy is what makes things happen!

All organisms need a constant supply of energy to stay alive. How do organisms get the energy they need for life? As you probably know, we get it from our food. But how?? Food is matter. Is it possible that the matter in food is turned directly into energy? Can matter ever be converted to energy?

The answer is that inside of organisms, matter cannot be turned into energy. You may be wondering about E=mc2. Doesn’t it tell us that matter can be turned into energy? Not exactly. It says that mass can be turned into energy - BUT this equation describes something that only happens in nuclear reactions. Are nuclear explosions happening in our cells? Obviously not! So if food is not being converted directly into energy, there must be something else going on that allows us to get energy from our food.

***SUMMARY***

|  |  |
| --- | --- |
| **Paragraph** | **SUMMARY or MAIN IDEAS** |
| **1** |  |
| **2** |  |
| **3** |  |
| **4** |  |