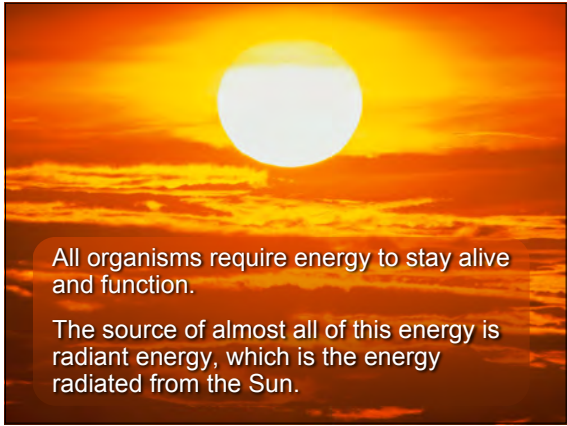


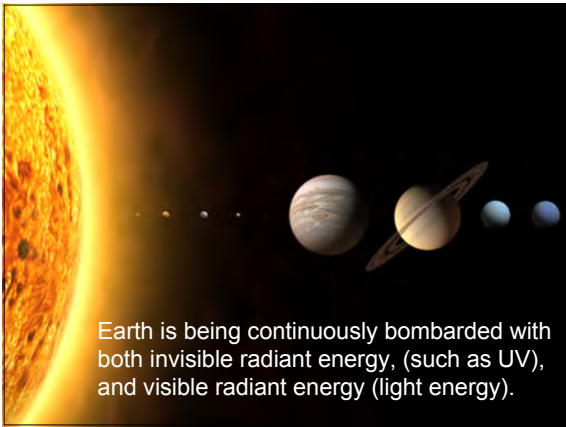


Energy Flow in Ecosystems

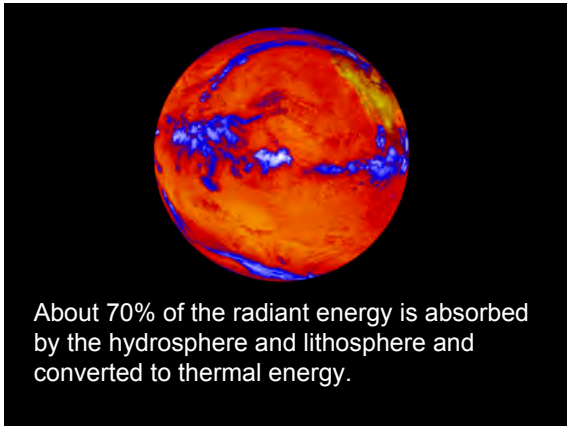


All organisms require energy to stay alive and function.

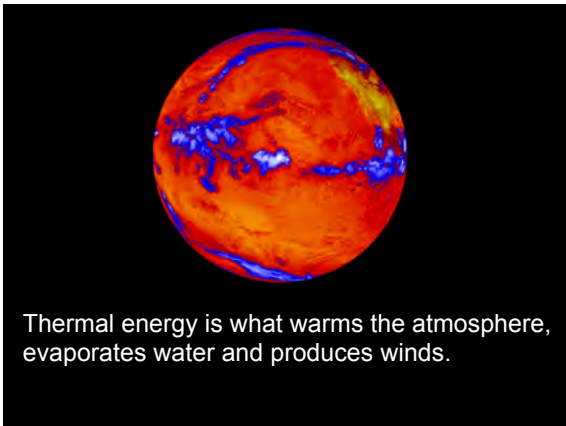
The source of almost all of this energy is radiant energy, which is the energy radiated from the Sun.



Earth is being continuously bombarded with both invisible radiant energy, (such as UV), and visible radiant energy (light energy).



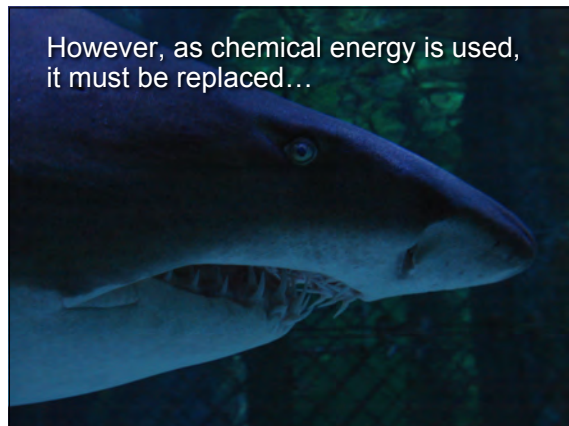
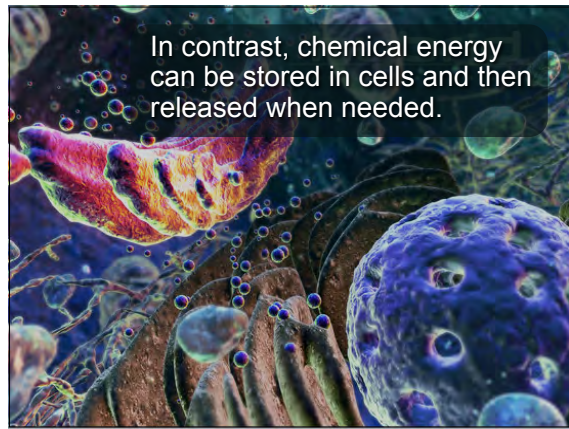
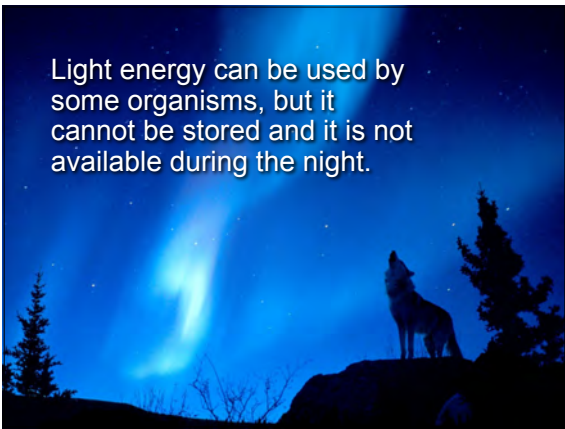
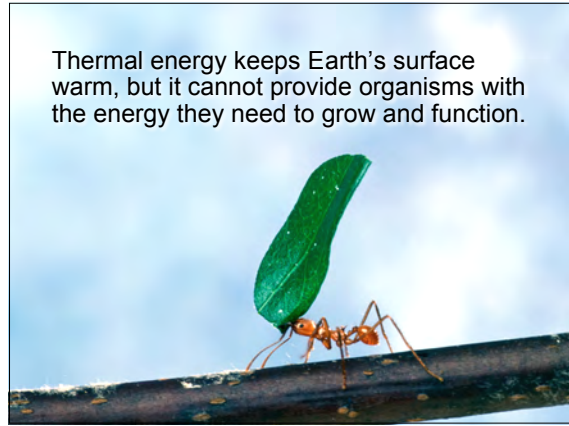
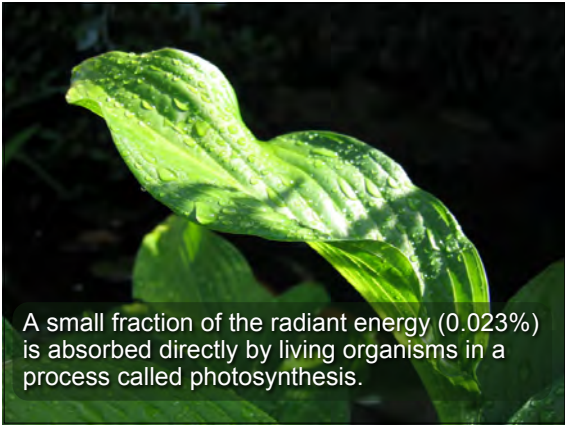
About 70% of the radiant energy is absorbed by the hydrosphere and lithosphere and converted to thermal energy.

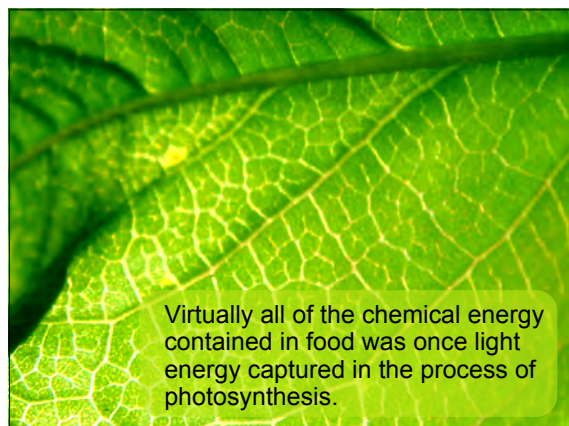
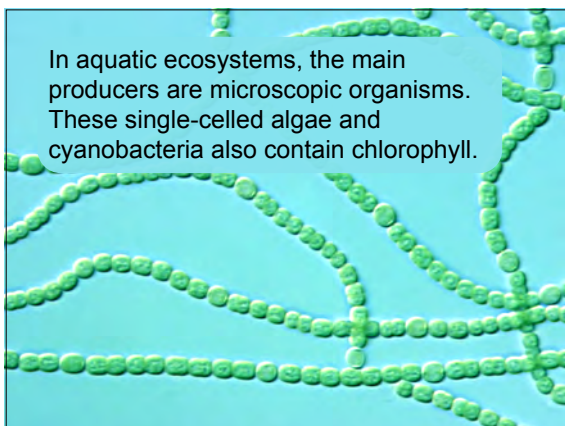
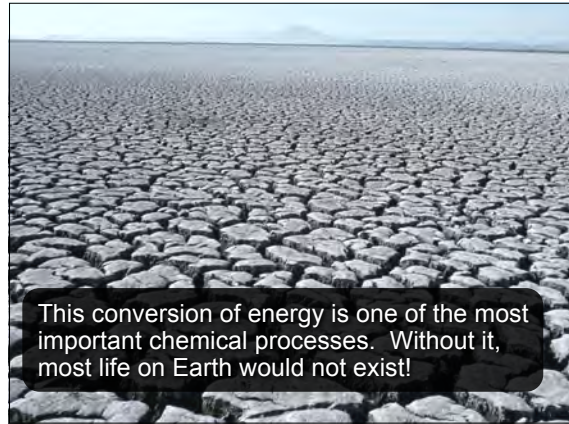
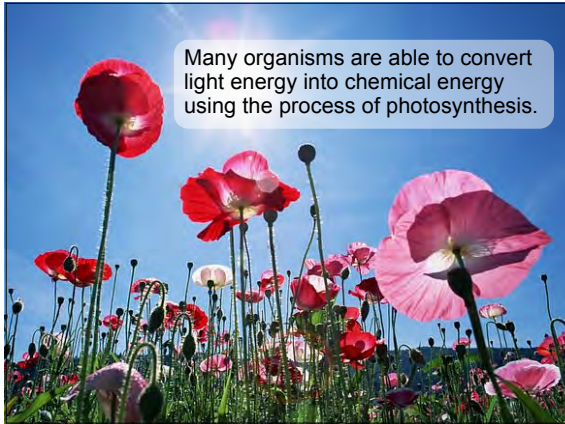


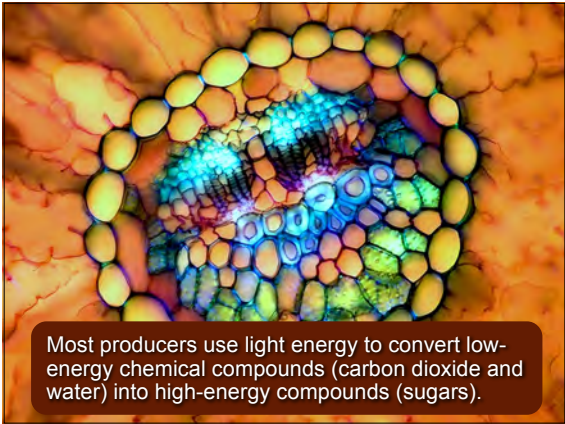
Thermal energy is what warms the atmosphere, evaporates water and produces winds.



The remaining 30% of the radiant energy is reflected directly back into space.








Photosynthesis


In doing so, they release oxygen gas into the environment as a by-product.

Photosynthesis can be represented by the following word equation:

carbon dioxide + water $\xrightarrow{\text{light energy}}$ sugar + oxygen

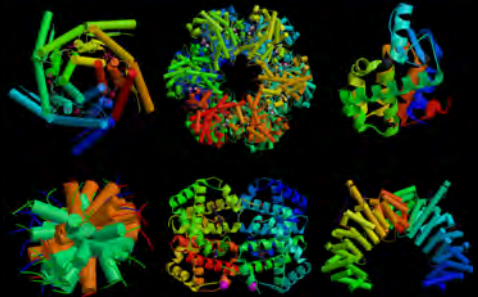


Photosynthesis




The sugar formed in this process contains stored chemical energy.

This energy is stored in the roots, stems, leaves and seeds of plants.



Not all of the sugar produced through photosynthesis goes towards energy storage. Some sugars are used as building materials to form carbohydrates or proteins.

Cellular Respiration




Photosynthesis produces stored energy in the form of sugar.

To make stored energy available for use, the plant performs a complementary reaction called cellular respiration.

Cellular Respiration

Cellular respiration is a chemical process in which energy is released from food.

In this process, the sugar and oxygen are rearranged to form carbon dioxide and water.

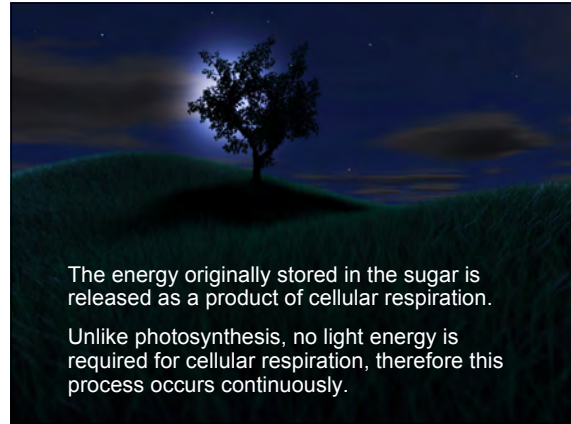


Cellular Respiration

As this reaction takes place, energy is released. The plant is able to use this released energy for any of the activities carried out by its cells.

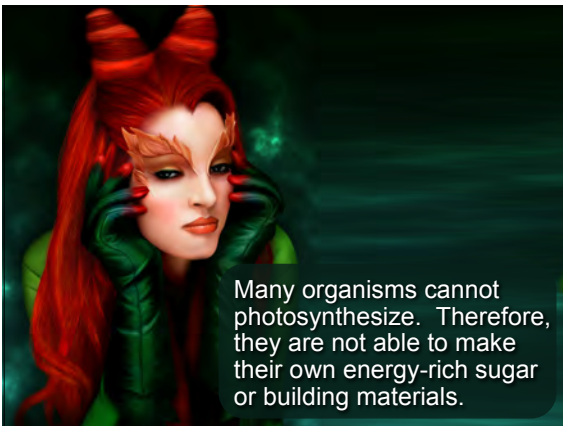
The word equation for cellular respiration is:

sugar + oxygen \longrightarrow carbon dioxide + water + energy



The energy originally stored in the sugar is released as a product of cellular respiration.

Unlike photosynthesis, no light energy is required for cellular respiration, therefore this process occurs continuously.

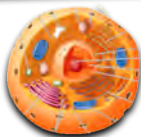


Many organisms cannot photosynthesize. Therefore, they are not able to make their own energy-rich sugar or building materials.



These organisms, called consumers, obtain energy and building materials by eating other organisms.

The Consumers



To obtain useable energy from food, consumers undergo cellular respiration.



While only producers undergo photosynthesis, **both** producers and consumers perform cellular respiration.

The Consumers

Humans are consumers, obtaining energy by eating other organisms.

Without photosynthesizing producers, consumers would not have a source of food.

