Energy and Matter in Living Systems

All organisms need matter and energy.
K-LS1-1

Sunlight is the major source of energy for organisms on Earth.

Plants obtain energy directly from sunlight to make food.
2-LS2-1

Animals obtain energy indirectly from sunlight.
5-PS3-1

Plants use the energy from the sun to rearrange the matter in air (carbon dioxide) and water to produce food such as glucose. This process is called photosynthesis.
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
2-LS2-1, 5-LS1-1, MS-LS1-6

The food (glucose) the plants make in photosynthesis can be used immediately, stored for later use, used to build important structures inside the plant, or consumed by animals.

Animals must eat food and breathe air to obtain matter and energy.

In order to support life processes, plants and animals must change the energy stored in food to a more usable form. This process is called cellular respiration.
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
MS-LS1-7

An organism's growth is controlled by genetic and environmental factors (ex: food intake, space, and interactions with other organisms). However, each species has a typical adult body size.
MS-LS1-5

When organisms die, their matter decomposes and goes back into the soil and the air.
5-LS2-1, MS-LS2-3