

Harvesting Sunlight

Your body needs energy to breathe, move, think, digest food, and do everything else you need to do. To power all these tasks, your body gets energy from the food you eat. Of course, humans aren't the only organisms that need energy to live. The same is true of all organisms, including plants. However, plants don't eat the way humans do—they have their own way of taking in energy. It's called photosynthesis, and it's the process of absorbing energy from light to make food.

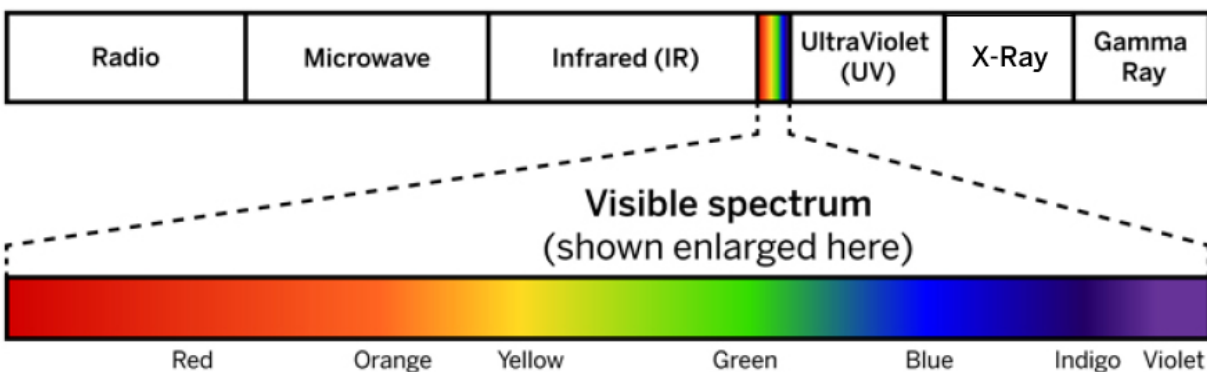
If plants can use energy from the sun to make food, can they use energy from any light source for food? How about a flashlight or a laser? Some light sources can power photosynthesis and others can't, depending on the types of light those light sources emit. That's because plant cells only absorb certain types of light, including infrared, most visible light, ultraviolet light, and X-rays. Even though a plant's cells absorb several types of light, plants can only use some of those types for photosynthesis. Most plants use the energy from blue and red light for photosynthesis. These are the types of light that help plants grow.



Plants absorb most types of visible light. However, they do not absorb green light. The green light that can't be absorbed is reflected instead, which is why most plants appear green.

The sun is a light source that emits lots of different types of light, including types that can't be absorbed by plant cells or used for photosynthesis. What happens when these types of light come in contact with plants? It depends on the type of light. Some types of light, like radio waves, pass straight through the plants without being absorbed. Other types of light are reflected instead of absorbed—most plants appear green because they reflect green light.

The types of light that plant cells absorb but can't use for photosynthesis change the plants in other ways: infrared light causes plants to



The types of visible light are red, orange, yellow, green, blue, indigo, and violet (ROYGBIV). Humans can see these types of light, but most of the light emitted from the sun is invisible to humans.

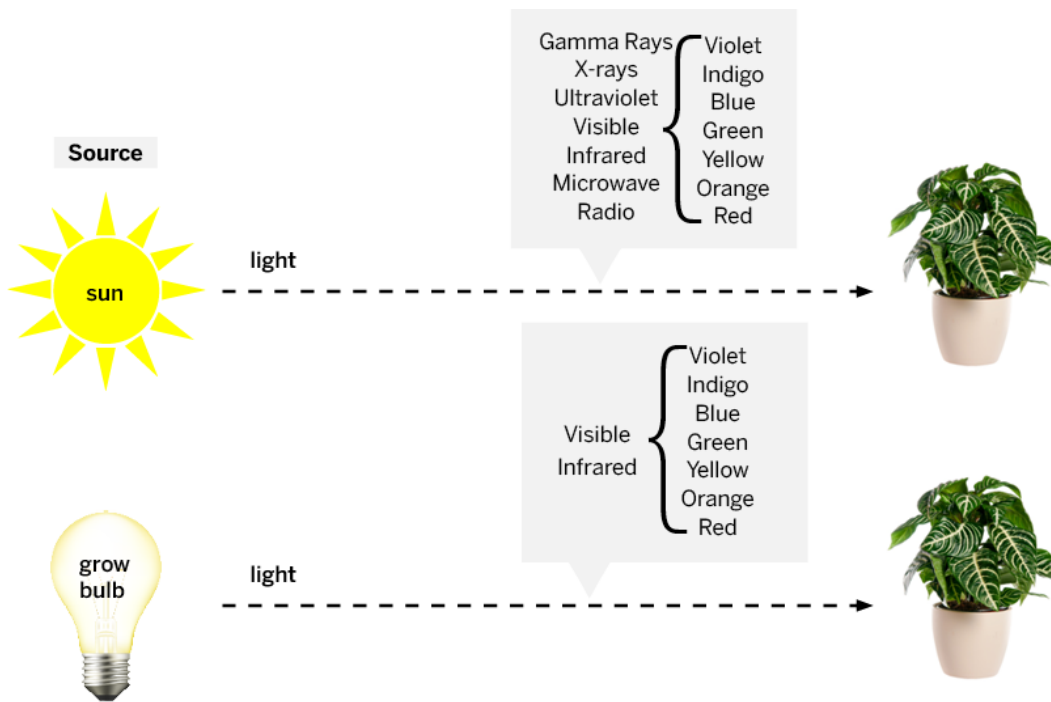
heat up, and ultraviolet light actually damages plants. Too much ultraviolet light can cause plants to die! These different examples show that absorbing different types of light can affect plants in different ways—some that are helpful to the plants, and some that aren't so helpful.

Light Emitted from the Sun

Can plants use light from a lightbulb to grow? Yes, if the lightbulb emits the right types of light. In fact, some people have figured out how to use lightbulbs to grow plants for food in especially dark places, like Antarctica. Antarctica gets no sunlight for six months of the year. Since people in Antarctica cannot depend on sunlight to grow plants, they use special bulbs that emit a lot of the types of light that plants can use for photosynthesis, and less of the types that plants don't need. These "grow bulbs" emit all the types of visible light (red, orange, yellow, green, blue, indigo and violet) and some infrared, but they do not emit gamma rays, X-rays, ultraviolet, or radio waves, like the sun does.



Antarctica is dark for six months of the year, and there isn't enough light for plants to grow there naturally.



The sun emits all types of light. A grow bulb is designed to emit a lot of the types that plants need for growth and very little of the types that plants don't need.