

# PHOTOSYNTHESIS

Green plants are the source of all our food. Like a very efficient factory, the green plant is constantly producing nourishment in the form of sugar, starch, fat and protein. The raw materials it uses are carbon-dioxide from the air, soil and water.

Photosynthesis is the process in which the energy of light is captured by the green plant and stored as the energy of food.

Energy to run the factory comes from sunlight. The special machinery doing the work is the chloroplast. The waste product of the plant factory is oxygen.

In these slides we shall see how this remarkable food factory works.

The magnification given, for example, 110x for Slide 1 - Green Leaf - means that the microscope was set at that power when the photograph was taken.

ond layer plays the most important part in the making of food. The layer below this has spaces (A) for the circulation of air.

The bundle of dark green and red cells (B) is a cross-section of a vein in the leaf.

## 1 GREEN LEAF (110X)

On this slide we have a cross-section view of the leaf of a maple tree. The top and bottom layers of cells protect the leaf. The sec-

After three hours in bright light, the chloroplasts were extracted with hot alcohol. The leaf was then treated with iodine and spread on a slide under a microscope.

The part that had been green, because of the chloroplasts, is on the left. The part of the leaf that had no chloroplasts is on the right.

List your observations. What does this experiment prove?

## 6 LEAF - VARIEGATED (35X)

This slide appears to be the same as the previous one, but it is not.

A different experiment is shown in this leaf. A coleus plant leaf had two colors. The outer region of the leaf was green because of the presence of chloroplasts, while the inner part was pale because it had no chloroplasts.

a potato.

These different starch grains reflect polarized light at different angles. Notice how the polarized light creates different cross patterns in the various starch grains.

Scientists often use polarized light to identify the type of plant which made the starch.

## 7 STARCH GRAINS (135X)

Many of the foods we eat contain starch. Plants first manufacture sugar, which they usually transform into starch, because the starch is stable and more easily stored. Shown on this slide are different starch grains from rice, wheat, barley, a bean and

the design of the embryo leaf is visible.

A large supply of food for the developing plant is stored in the entire dark mass - the cotyledon (KOT-e-lee-don).

The cotyledon has been stained with iodine. Observe the color. What does it indicate?

## 8 BEAN SEED (2X)

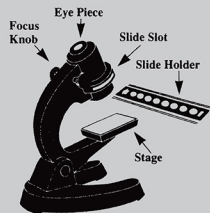
This is one half of a germinating bean seed. It is just beginning to form a new plant and the developing embryo may be seen at (E). The lower part of the embryo will form the root and stem of the plant. In the upper part,

We have seen that the energy radiated by the sun is captured by the chloroplasts in green plants, converted into chemical energy in the form of sugar and starch.

Man and other animals benefit from this process - photosynthesis - by eating the stored food of the plant and converting the energy contained in it to their own use.

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