



Elizabeth Kubey
Photo: Jisoo Kim

Get your chlorophyll of plants

BY ELIZABETH KUBEY

What is your favorite recipe? One of mine is butternut squash chili! I go to the store to pick up all the ingredients for my favorite dish. But unlike us, plants can't go shopping for their meals. Instead, they use the ingredients in their environment to make their own food. These activities will show us what that's like for our plant friends.

Before we start our activities, let's review some terms:

Photosynthesis is from Greek words: photo=light, synthesis=putting things together.

Physical change is when matter (stuff) changes in appearance without making a different kind of matter. *Example: Cutting a whole apple into slices*

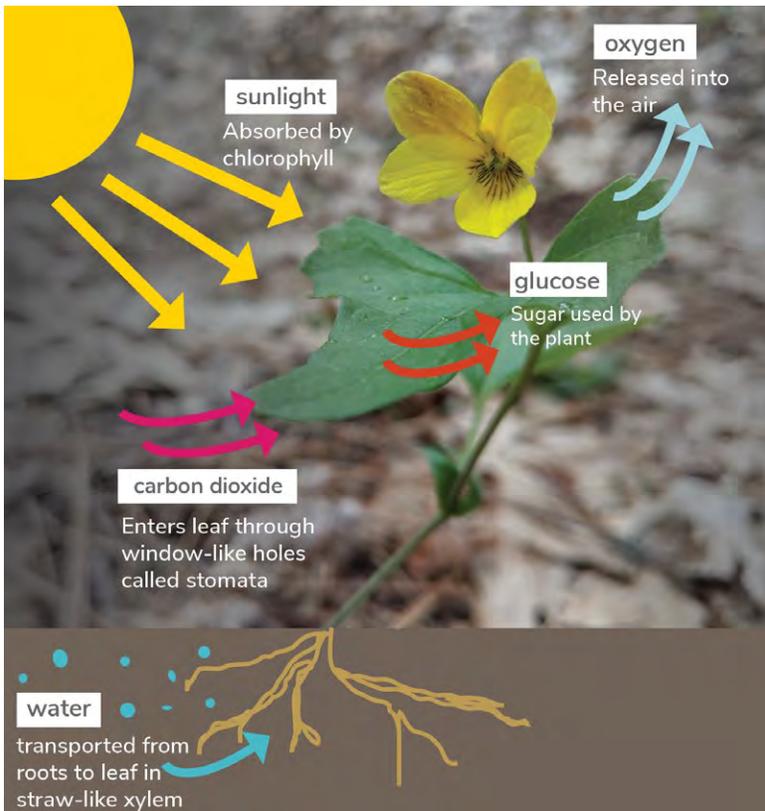


Chemical change happens when stuff turns into different matter with different properties. *Example: A rotting apple*



Chlorophyll is a green pigment (natural color) found in many plants. It helps make food from sunlight, air, and water.

Chloroplasts are the part of a plant where photosynthesis happens. Chlorophyll is in the chloroplasts.



Photosynthesis process with a violet (*Viola sp.*) by Elizabeth Kubey

(Photo)synthesis

- ✓ Best for ages 8+
- ✓ 20 minutes
- ✓ Camera
- ✓ Printer
- ✓ Drawing materials

Photosynthesis flow

Photosynthesis is energy transformation. Energy is power that comes from chemical or physical sources. Our bodies transform food we eat into energy we can use to be active. Plants take in light energy and transform it into chemical energy to make food (glucose). That's called photosynthesis.

Now that you know a bit more about photosynthesis, let's connect the process to native plants around you.

- 1) Find a native plant and see if you can imagine how the photosynthesis process flows through this plant.
- 2) Take a photo of a native plant and print it out.
- 3) Following the example on the left, draw the arrows and label what the arrows show. You can imagine what the roots might look like below the soil or research in a book or online what they look like.
- 4) Compare your photo to a friend's!

Fall colors

Looking at the photo on the right,

How many different colors do you see in these leaves?

If you see more than one color, why do you think that is?

Go outside and find a tree in your neighborhood. Take photos of the same tree leaves over the season to see how they change.



Quaking aspen (*Populus tremuloides*). Photo: Elizabeth Kubey



Relay Race (Lesson adapted and photo from ellenjmchenry.com)

- ✓ Best for ages 10+
- ✓ 30 minutes
- ✓ Group of 4-10
- ✓ Green construction paper
- ✓ 10 index cards
- ✓ Envelopes
- ✓ Glue
- ✓ Marker
- ✓ Paper
- ✓ Flashlight
- ✓ Kids scissors

Photosynthesis requires teamwork between all players in the process! Let's play a fun game to work together and better understand **photosynthesis: water + carbon dioxide + sunlight = oxygen + glucose**

Assembly (15 minutes)

Cut two large leaves from the green paper. Glue an envelope on each side of the leaf with the open side facing out. Label the envelopes on opposite sides of the leaves with "IN" and "OUT."

On 5 index cards, label each one with one part of photosynthesis: water, carbon dioxide, oxygen, glucose (sugar). Repeat this on 5 more cards to make two sets. *Optional: Decorate your cards to be easily read, like a raindrop for water.*

Set-up (5 minutes)

Put cards for oxygen and glucose in the "OUT" envelope of the leaves. Put water and carbon dioxide cards in piles at the start line. Put the leaves at a distance you can run to from the start line. Put flashlights by the leaves.



Let's play! (10 minutes)

Split into two teams. On the word go, the first member of the team takes either a "carbon dioxide" or "water" card from the start, runs to the leaf, and puts it into the "IN" pocket of their leaf. They run back and tag the next person. The second player takes the other start line card. The next person runs to the leaf, shines the flashlight on the leaf and says "photosynthesis," turns it off and then runs back.

Now the leaf has had all the ingredients for photosynthesis! The next player runs to the leaf and takes out just one of the cards in the "OUT" pocket and runs it back to the team. The fifth player runs to the leaf, takes the last card out of the "OUT" pocket and runs with it back to the team. The fastest team wins that round!

You can play more rounds where everyone dances, hops, skips, or walk backwards to the leaf!



Makena Sasaki Tsien appreciating an iris among the pine forest. Photo: Rebecca Miller Ricksen

Thank you, plants!

- ✓ Best for ages 6+
- ✓ 15 minutes
- ✓ Paper
- ✓ Pen

Photosynthesis is an important process that sustains life on Earth. Plants provide us cleaner air and water, food, and medicines.

"In some Native languages the term for plants translates to "those who take care of us."

— Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*

Find a space to write thank you letters. First, write a letter from you to a native plant. Then, write one as if you were that plant thanking a part of your ecosystem for helping you thrive. Maybe even write a third one to a family member you forget to say thanks to! Use the example letter on the right to get started.

Share your letters with Elizabeth! With the help of an adult, post on social media and tag @californianativeplantsociety or email ekubey@cnpns.org.

DATE _____

Dear _____
GREETING

Thank you for _____

I think you are _____

because _____

I hope you _____

CLOSING (FROM, BEST, etc) _____

YOUR SIGNATURE _____