



## ACTIVITY #1 (30 MINUTES)

ALL GRADES

### OBSERVE, DRAW & DISCUSS KALE

Students will watch a [five-minute video](#) of a farmer introducing broccoli, cauliflower, and the brassica family.

#### MATERIALS:

- Kale, and other leaves if possible such as spinach and chard for observation
- Magnifying glasses
- Paper or journals
- Colored pencils

**Optional:** images showing the common patterns in trees, veins, lungs, roots, rivers.

**PREPARATION:** Gather materials. Print or find & test a way to project images.

**PROCEDURE:** Write the focus question on the board: "What's in a leaf?" Pass out a kale leaf to each student or pair of students, and ask students to look carefully at their leaves.

All kids should draw what they see. Direct them to label their drawing with any parts that they know of. After students have had some time to observe and draw independently, and do some labeling, bring them together and have them add more labels to their drawing/diagram. It may be helpful to model drawing step by step on the board or if appropriate, display a diagram on the smartboard. As you talk about the parts you can see, discuss their functions, or "jobs."

Here are some suggestions for what to discuss with each age group, and explanations of what each part does for the plant in the section **Parts of the Leaf We Can See & Their Jobs**.

**KINDERGARTEN:** Draw pictures of leaves, or trace leaves. Some may give their drawing a title - "Kale," or "Kale Leaf."

**GRADES 1-2:** Title their drawing, and draw and label these parts of the leaf:

- Blade
- Stem
- Veins

**GRADES 3-4:** Title their drawing, and draw and label the:

- Blade/Lamina
- Stem
- Petiole
- Veins
- Epidermis



*(activity #1 continued)*

## PARTS OF THE LEAF WE CAN SEE

**BLADE:** The main part of the leaf; all of it except the stem, veins and petiole. The blade of the leaf takes in sunlight and turns it into food. It is also where the plant “breathes.”

**LAMINA:** Scientific word for blade of a leaf.

**STEM:** The stem supports the leaf (like our skeleton supports us, and our legs), and, like the veins, transports (or moves) water, minerals and food energy.

**PETIOLE:** The stalk of the leaf, which attaches to the stem of the plant. Its job is to hold the leaf to the rest of the plant.

**VEINS:** AKA vascular bundle. The veins’ job is to transport (move) water, minerals and food energy through the leaf and on to the rest of the plant. The veins in a leaf do the same things that the veins in our bodies do!

**EPIDERMIS:** The outer protective layer of a leaf. Epidermis is a fancy word for skin. We have an epidermis too - our skin! Sometimes the leaf may be waxy because the epidermis secretes a waxy protective cuticle. This waxy covering protects the leaf, and in the case of Kale, is a reason it is cold hardy.

When discussing the veins, you might take some time to prompt students to **compare the way veins look and function to other structures in nature**. Ask students to look at the veins in their drawing of the kale leaf, or at the veins of the actual leaf. Then ask, “Do we see these patterns anywhere else in nature?” Guide the conversation to trees, and veins in human bodies. Provide illustrations to demonstrate the similar fractal patterns in plant and animal organisms, and in rivers. These can be displayed on a smart board if the classroom has one, drawn on the board or you may print images to share.

Ask students to think about and guess why these things might look similar. Some theories they might come up with include the fact that these structures (veins in humans, veins in plants, streams flowing into rivers) do similar things, and/or that their shape is perhaps the most efficient. This is just an interesting conversation and thinking exercise, there is no set conclusion or fact that students should come to.

After discussing the parts of a leaf that we can see, and what each part does, then ask and discuss “What’s in a leaf that we can’t see?” Below are some suggestions for what to discuss with each age group, and explanations of each topic in the section **What’s In a Leaf That We Can’t See**.

### *Discussion Topics*

**KINDERGARTENERS:** nutrients & vitamins

**GRADES 1–2:** nutrients, vitamins & minerals; photosynthesis

**GRADES 3–4:** nutrients, vitamins & minerals; photosynthesis; chlorophyll



*(activity #1 continued)*

## PARTS OF A LEAF WE CAN'T SEE

**NUTRIENTS:** Nutrients are the parts of food that give us energy. Explain that leaves can be considered the food factories for a plant. Things inside the leaf that we can't see convert energy from the sun into energy, or nutrients, that plants can use, and that we can use when we eat plants!

**VITAMINS:** The vitamins found in green leafy vegetables support our skin, help our immune system block sickness, help our body and our brain. Vitamins found in leafy greens: A, B, C, E, and K.

**MINERALS:** The minerals found in leafy greens help our bones, heart and nervous system. They also keep us from getting sick. Minerals found in leafy greens: Calcium, Sulphur, Magnesium

**PHOTOSYNTHESIS:** The process in leaves converting light energy to food for the plant. Carbon dioxide and water are used in photosynthesis and oxygen is released. We cannot see that photosynthesis happening. It is important because without it, we wouldn't get any energy from eating plants! And, the oxygen that is made

**CHLOROPHYLL:** Leaves are the part of the plant richest in chlorophyll, which makes them green. So we actually CAN see chlorophyll. Chlorophyll is used in the process of photosynthesis. Chlorophyll supports our body in making blood, and our liver in getting rid of bad stuff in our blood (toxins) when we eat it.

### Closing

Close this activity by having students write on their diagram, or in a journal/science notebook about what is in a leaf. Ask, "What are the things in a leaf that we can see, and what are the things we cannot see?" On their journal page, students may write letters of the vitamins (**for grades K-1**), key vocabulary words (**grades 1-2**), or full sentences (**grades 3-4**) answering this question.

## ACTIVITY #2 (20 MINUTES)

ALL GRADES

### READ KALE LITERATURE

Read ***Captain Kale and the Super Foods*** by Amy Roth. This illustrated book tells the story of a battle between the junk food and healthy food in the pantry of one little boy, and teaches the importance of eating whole foods for our health.

See the introductory chapter for information and ideas on how to engage students in reading about healthy foods.