

General Lessons Outline:

- How To Be Respectful to Plants → What Do They Need From Us?
 - Why do we need plants? Why do they need us?
 - What are your favorite plants? Nature name?
- Plant Life Cycle (See pasted info below)
- Plant Communities in CA
 - **Oak Woodland/Grassland:** Plant community located in the coastal areas and the interior valleys of the Pacific Coast Ranges
 - **Riparian:** plant community located towards the inland of California on the banks of rivers and streams
 - **Desert:** areas of low rainfall and high and low elevation
 - **Redwood:** plant community located along the Pacific Coast Ranges in North America
 - **Mixed Evergreen Woodland:** plant community located along the Pacific Coast Ranges in North America
 - **Chaparral:** plant community located inland in California
 - **Coastal Sage Scrub:** plant community located on the coast of California
- Why Grow Your Own Food?
 - Knowing exactly where your food comes from and how it grew
 - Growing your favorites, why growing plants makes us feel good
 - Why growing for other people is meaningful
- How Native Plants Help Food Plants
 - Restoration ecology
 - Pollinators
 - Nutrients and water sourcing
- How regenerative garden/farming models save ecosystems
 - Endangered/at-risk species (pollinators, plants)
 - Clean air, clean soil, retention of water
- Farm labor and industrialized food systems
 - Migrant workers and exploitative work
 - Pesticides and human health → next generation of children and illnesses
 - How far food actually travels from farm → store → plate
- Community Togetherness
 - Working together as stewards to create niches for ecosystems
 - Providing accessible healthy foods to communities
 - Understanding plants and their relationship to our health

Plant Life Cycle

Lesson 1

Relevant California Science

Standards:

K-ESS2, K-ESS3, K-LS1, 1-LS1, L-LS3, 2-LS2, 2-LS4, 2-ESS2, 3-LS1, 3-LS2, 3-LS3, 3-LS4, 3-EES2, 3-ESS3, 4-LS1, 4-ESS1, 4-ESS2, 4-ESS3, 5-LS1, 5-LS2, 5-ESS2, 5-ESS3, MS-LS1, MS-LS2, MS-LS3 MS-LS4, MS-ESS2, MS-ESS3

Vocabulary:

All Grades:

Reproduction – how plants and animals make new plants and animals like themselves

Life Cycle- the changes organisms go through as they develop from eggs or seeds to adults that reproduce

Seed- the reproductive unit of a plant

Germination- when a seed of a plant sprouts

Stem- the stock of a plant from which leaves and buds grow

Roots- the part of the plant that is underground that the plant absorbs water and nutrients from the soil with

Flower- the reproductive part of the plant

Pollination- the transfer of pollen from the flower of a plant to the reproductive organs of a plan

Add for 3-8th Grade:

Stigma-female reproductive part of seeding plants

Pollen-the male reproductive part of seeding plants

Genes-the parts of the cell that carry the information that determines the traits, or characteristics that each individual has

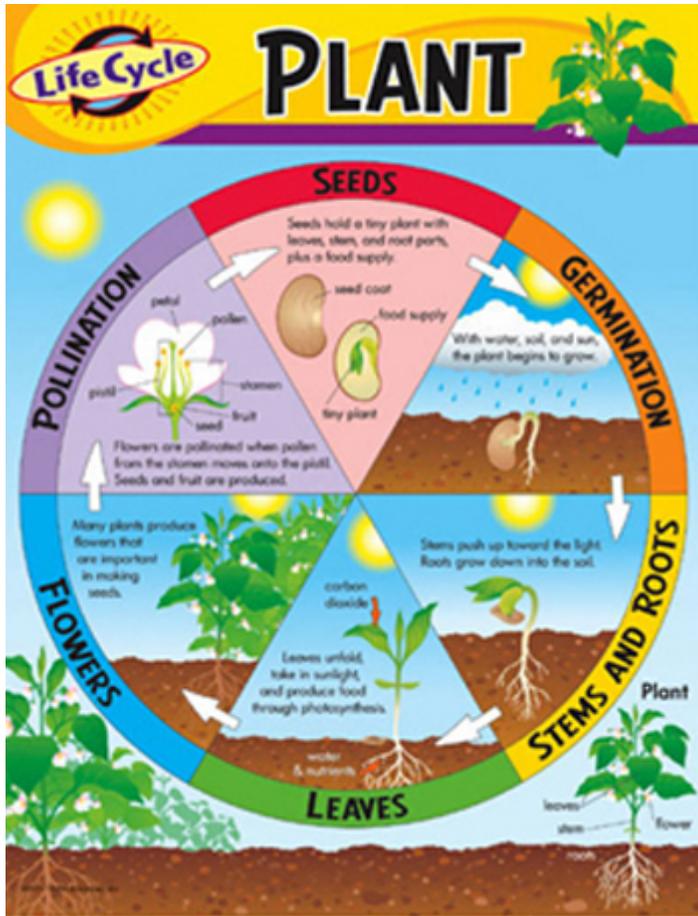
Germination- when a seed sprouts

Add for 6-8th Grade:

Gametophyte- the stage in a plant's life cycle when it produces

Gametes- reproductive cells that only contain one set of dissimilar chromosomes (sperm and egg).

Sporophyte- the stage in a plant life cycle when it is nonsexual and only produces only spores



Lesson Outline:

I. What is **reproduction**?

- a. How plants and animals make new plants and animals like themselves
- b. Different organisms reproduce differently

c. Have students name some ways different organisms reproduce. For example, reptiles and birds lay eggs and mammals have live births.

II. What is the life cycle of a plant?

- a. 6 stages
 1. Seed
 2. **Germination**
 3. **Stems and Roots**
 4. Leaves
 5. **Flowers**
 6. **Pollination**

III. What are **genes**?

a. **Genes** are the parts of the cell that carry the information that determines the traits, or characteristics that each individual has.

b. For example, the color flower a plant produce or what color eyes a person has.

IV. How do animals help plants reproduce?

a. Animals like coyotes and cows eat berries and other parts of the plants that contain seeds. The seeds are pooped out by the animals and put into the soil.

IV. Why is pollination so important?

a. It allows plants to reproduce successfully

b. Have the students name was in which plants are important for our ecosystem

V. How do human's disturb a plant life cycle?

a. Through the alteration of genes making it so plants cannot produce viable seeds

b. By placing plants outside of their native ecosystem so they have to work harder to get the nutrients, sunlight, and water they need.

c. By killing their pollinators so they are unable to be pollinated and reproduce

d. Destroying a plant's ecosystem through industrial agriculture, urban land development, and mining

Activity 1:

Plant Life Cycle Spinners

Materials :

- Large pieces of cardboard (for spinners)
- Brads
- Construction paper (for pointer)
- Crayons/ colored pencils
- Scissors

Instructions (for activity in list form):

- 1) Have students break into small groups of 4-5 students.

- 2) Each group will have a spinner wheel with six stages of the plant life cycle on them.
- 3) Each student takes a turn spinning the wheel and finding a plant around the garden that is currently in that stage of its life cycle.
- 4) For younger students take them around to plants in the garden at each stage in the life cycle and have them guess which stage the plant is in by matching it to the picture

Activity #2:

Name of Activity: From seed to my lunch!

This activity will help reinforce the concept of the life cycle of plants and how they go from seed to food in our lunch, which then creates more seeds for the continuation of the cycle (for younger grades)

Materials (for activity):

Ordinary fruits/vegetables (apples, oranges, cucumbers, etc) from the garden or ask kids in advance to bring it from their lunch
A flowering plant to demonstrate

Instructions (for activity in list form):

- 1) Pick a flowering plant and ask the students to identify the different parts of the plant that are visible: roots, stems, leaves, and flowers
- 2) Ask where they think that fruit would come from in the plant they are looking at: where would seeds come from? How does the plant continue living?
- 3) Introduce the ordinary fruits/vegetables: ask the students if they are familiar with them/ if they know what is inside: cut it open and demonstrate the seeds. Ask what will happen and have each explain one part of the life cycle of the plant

Activity #3

Name of Activity: Edible Plant Parts: SONG: Roots, Stems, Leaves, Flowers, Fruits, and Seeds

Materials (for activity):

Poster paper with the lyrics for the song written
Plants/vegetables available that can demonstrate the different plant parts that are edible

Instructions (for activity in list form):

- 1) Ask the kids if they know different edible plant parts (ex: fruits: apples, pears, etc; seeds: sunflower seeds, pumpkin seeds, etc; roots: carrots, radishes, etc; stems: celery, asparagus, etc....)
- 2) Introduce the chorus of the song, and tell the kids when the line comes "...because a _____ is a __ (stem) ___ that I eat!" to yell out an example of what

ever plant part you are currently talking about

Lyrics to the song: from the Banana Slugs String Band

<http://bananaslugs.bandcamp.com/track/roots-stems-leaves>

ROOTS, STEMS, LEAVES

Chorus:

Roots, stems, leaves, flowers,
Fruits and seeds
That's six parts, six parts, six plant parts
that plants and people need.

The roots hold the plant
in the ground.
They gather up the water
that falls around.
And there's a root inside of me,
because a carrot is a root that I eat.
That's six parts, six parts, six plant parts
that plants and people need.

A stem is an elevator growing up from
the ground.
The water goes up and the
sugar back down.
And there's a stem inside of me
because celery is a stem that I eat.

The leaves are the kitchens
where the food is done.
They breath the air and
catch rays from the sun.
And there's a leaf inside of me
because lettuce is a leaf that I eat.
Chorus...

The flowers are dressed so colorfully.
They hold the pollen and
attract the bees.
And there's a flower inside of me
because cauliflower is a flower I eat.

The fruit gets ripe, then falls on down.
It holds the seeds and feeds the ground.
And there's a fruit inside of me
because an apple is a fruit that I eat.
Chorus...

Now you know what this
whole world needs.
It's roots, stems, leaves, flowers,
fruits and seeds.
There's six plant parts inside of me
because a garden salad is what I eat.
Chorus...

Activity #4:

Name of Activity: How are plants important to our lives?

This activity is meant to help students think about how plants are an important and necessary part of our lives; important for the air we breathe, the clothes we wear, the food we eat, the medicine we take when we get sick, the habitats in which we live, and the atmosphere and climate that affects our everyday lives. Emphasize learning how without plants, we would be without many important things.

more references here: <http://www.bgci.org/plantconservationday/whyplantsimportant/>

Materials (for activity):

- Examples of plants in different forms: clothing, medicine, food, soap, etc. examples can be found here: http://apps.rhs.org.uk/schoolgardening/uploads/documents/2010_Plants_in_our_Daily_Life_1176.pdf
- Plastic items; things that are not derivatives of plants
- Large ziploc bag/ paper bag to place all the items

Instructions (for activity in list form):

- 1) Ask the students what they think plants are used for, in general
- 2) As a review of the activity on plant parts, ask if they think that different parts of plants are used for different things
- 3) Based on answers given, let them know that plants play an extremely important role in just about all necessary items we use in our daily lives
- 4) Let them taking turns reaching into the bag, pulling out an item and guessing if it derives from a plant source or not; ask which plant source, ask what part of the plant they might think it was used from
- 5) Ask the kids if they can identify plant derivatives that they are wearing; have on them; was in their backpack, etc
- 6) Have the students journal the important role that plants play in our lives; ask them what would happen if we didn't have plants to continue playing this important role: ask about our role as human beings in conserving the plants to ensure healthy lives for both them and us.