Growing Plants from Seeds Grades 3-5

Goal: Teach students how plants reproduce by creating and sowing seeds.

UCCE Master Gardener Program of Riverside County

Master Gardeners

The University of California Cooperative Extension (UCCE) Master Gardener Program (MGP) is an educational program designed to teach and effectively extend information to address home gardening and non-commercial horticulture needs in California.

UCCE is the outreach arm of UC's division of Agriculture and Natural Resources (ANR). Master Gardener volunteers (MG volunteers) promote the application of basic environmentally appropriate horticultural practices through UCCE-organized educational programs that transfer research-based knowledge and information.

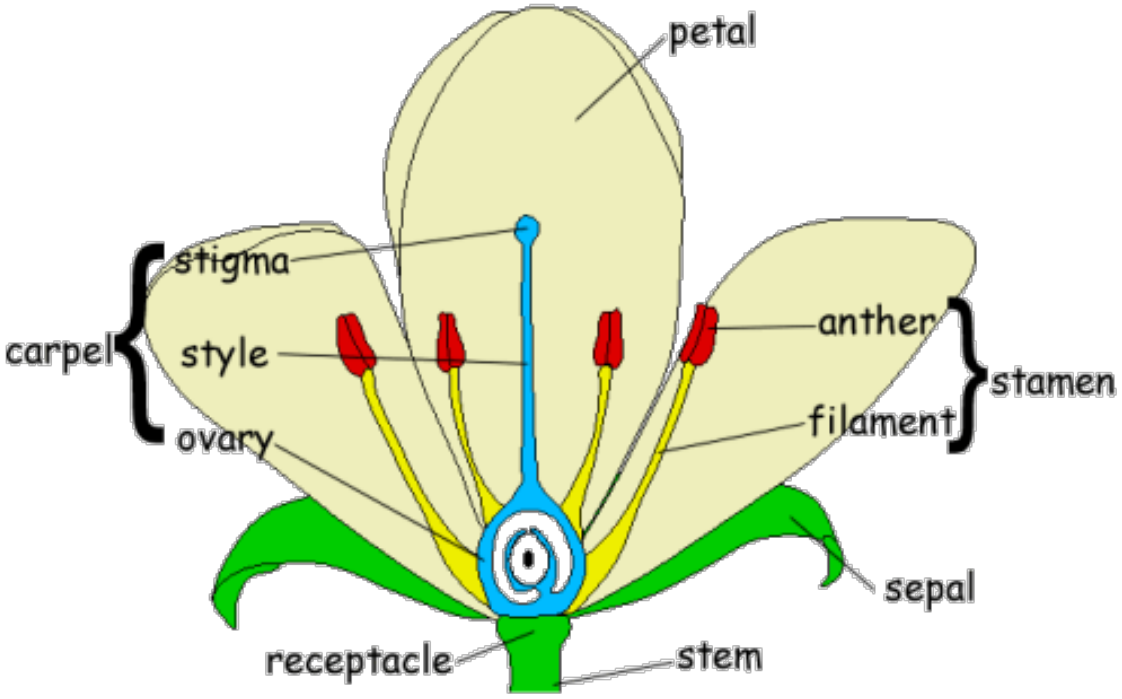
University of California
Agriculture and Natural Resources
UCCE Master Gardener Program

Most plants begin life as seeds.

What Part of a Plant Creates Seeds?

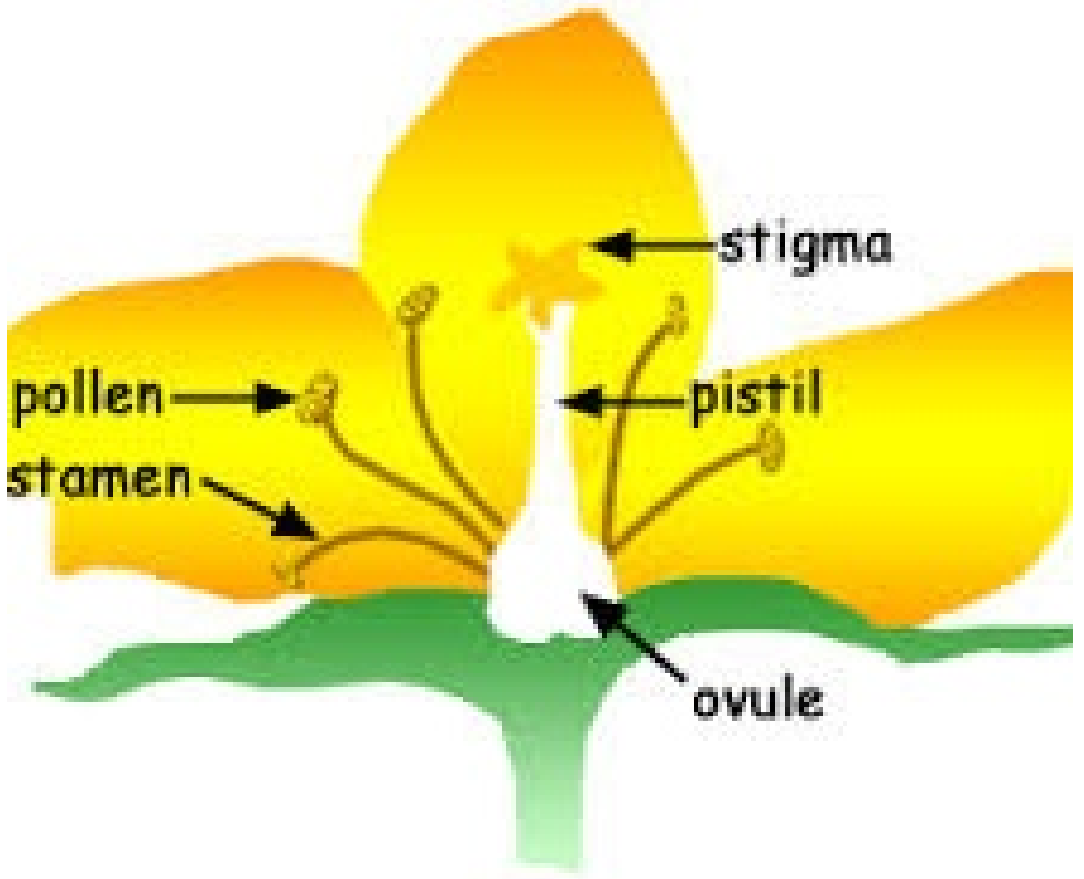
Flowers Create Seeds and Fruit

- Seeds come from the flowers of mature plants.
- If pollen is placed on the stigma of a flower by a bee, other pollinator, or the wind, the flower can develop seeds or a fruit with seeds.
- Seeds develop in the ovule once pollination occurs; fruit develops from the ovary.



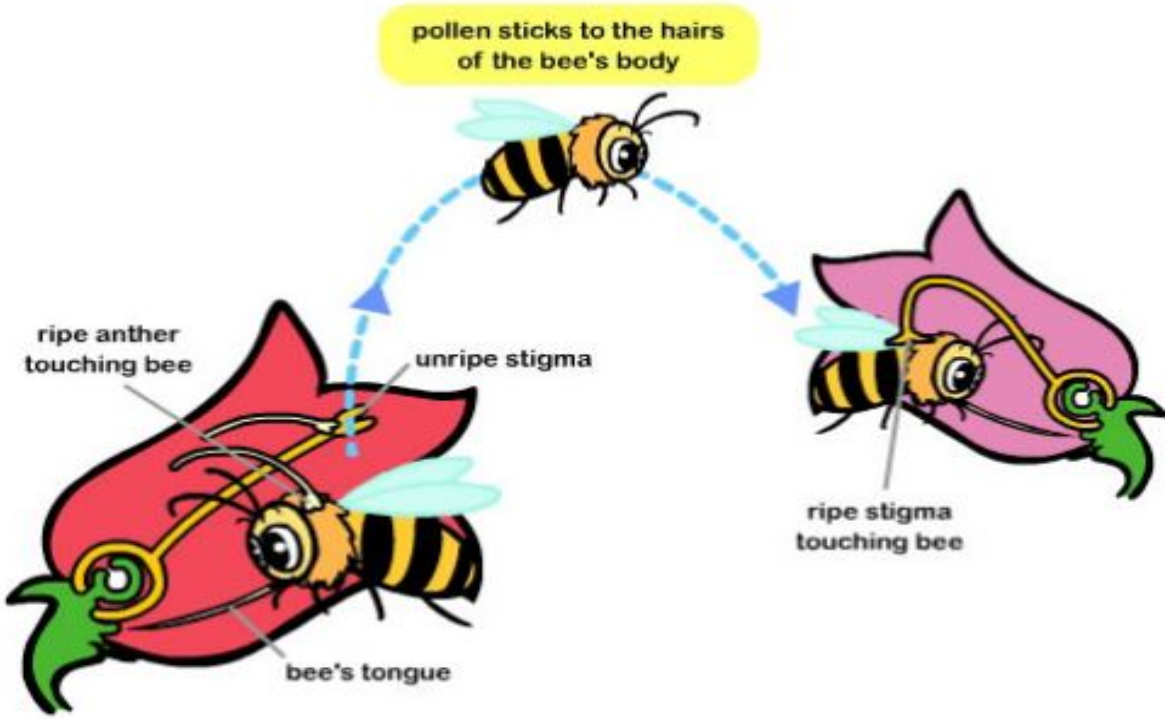
What is Pollen?

- Pollen is the fine yellow grain found inside a plant or a flower.
- Pollen helps the plant make seeds so new plants can grow and fruit can develop.
- Fertilization with pollen is needed for seeds to develop.



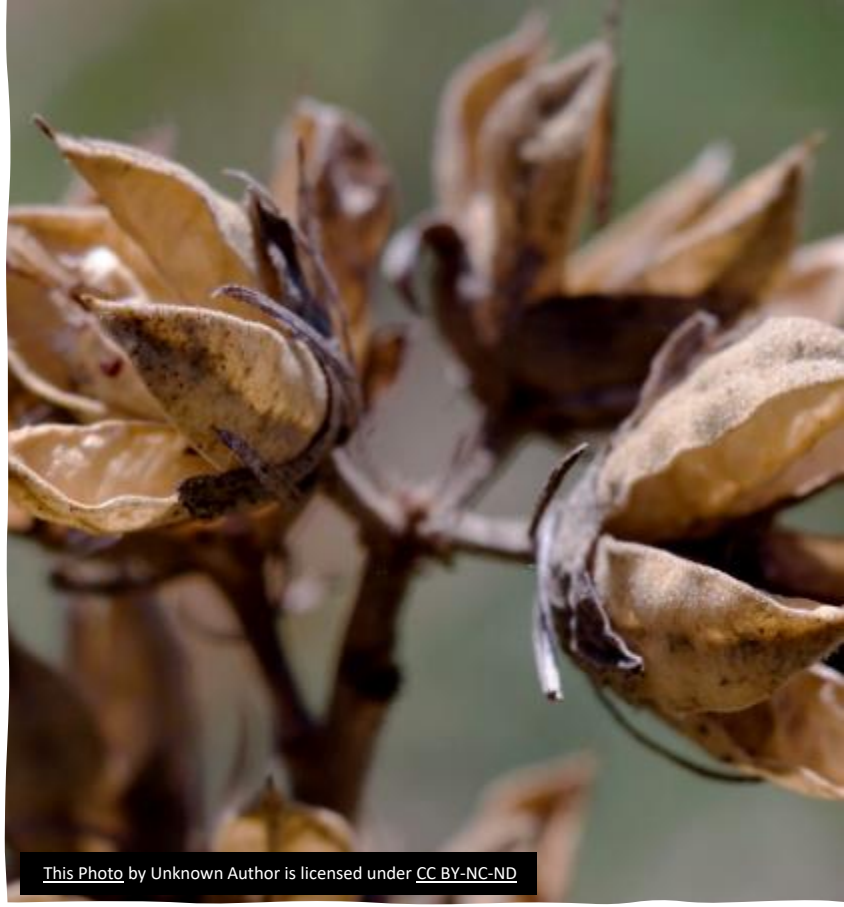
Pollination

This diagram shows how a been transfers the pollen from one plant to another.



Seeds can be very small or very big

Seeds come in many colors



Facts About Seeds

- A seed will grow the same type of plant unless there are environmental factors that change the new plant.
- Some seeds are in a protective coating called a seed pod. See pictures.

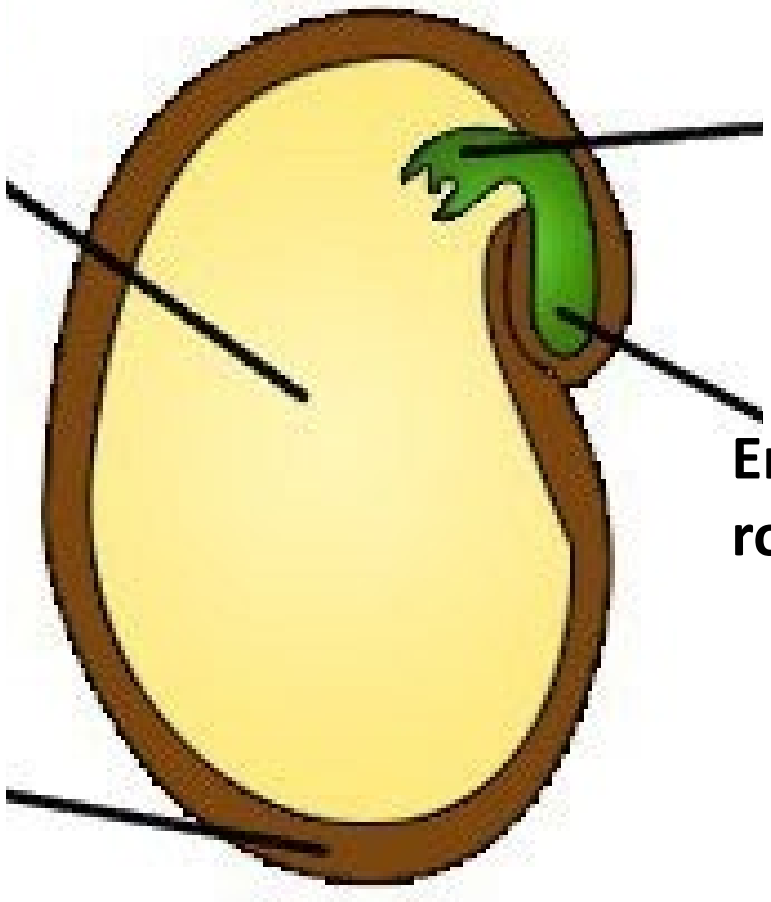
Seed Germination

- Germination occurs when a seed starts to grow.
- Seeds capable of germination are said to be **viable**. They contain a living embryo, or new plant.
- Germination starts when a seed **first takes in water** and ends when the seedling is self-sustaining.

Inside a Seed

Endosperm

Surrounds the embryo and provides nutrition with starch. May also provide protein and oils



Cotyledon

First Leaves
1 leaf-monocot
2 leaves-dicot

Embryonic stem and root

Seed Coat

Protects the embryo

Seeding in Nature

- When a flower ‘goes to seed’ it can drop seeds in the soil that will grow naturally.
- This scallion (onion) flower has gone to seed, and the seeds will fall to the ground and grow when conditions are right.

People Plant Seeds

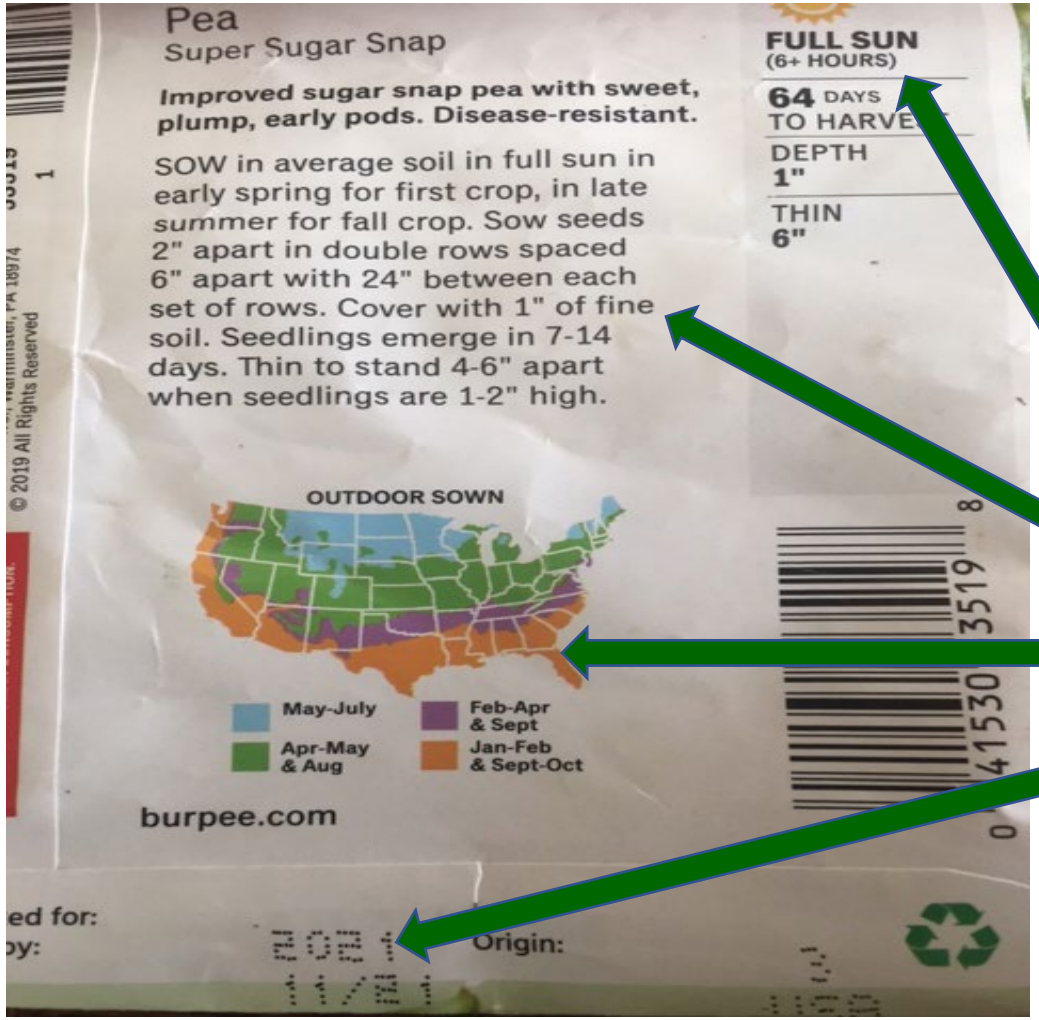
Why Do People Plant Seeds?

What Do Seeds Need to Grow?

The Right Environment

- **Water:** A continuous water supply is needed for germination. Lack of water means the embryo will die.
- **Oxygen:** The soil the seed is planted in should be loose and have air and water to provide oxygen.
- **Temperature:** The correct growing temperature will increase the rate of germination.
- **Light:** The right amount of light stimulates growth in plants.

Read Your Seed Planting Directions Carefully!



The seed package provides information on the important environmental factors for your seed's growth.

- Light
- Oxygen
- Temperature
- And viability of the seed

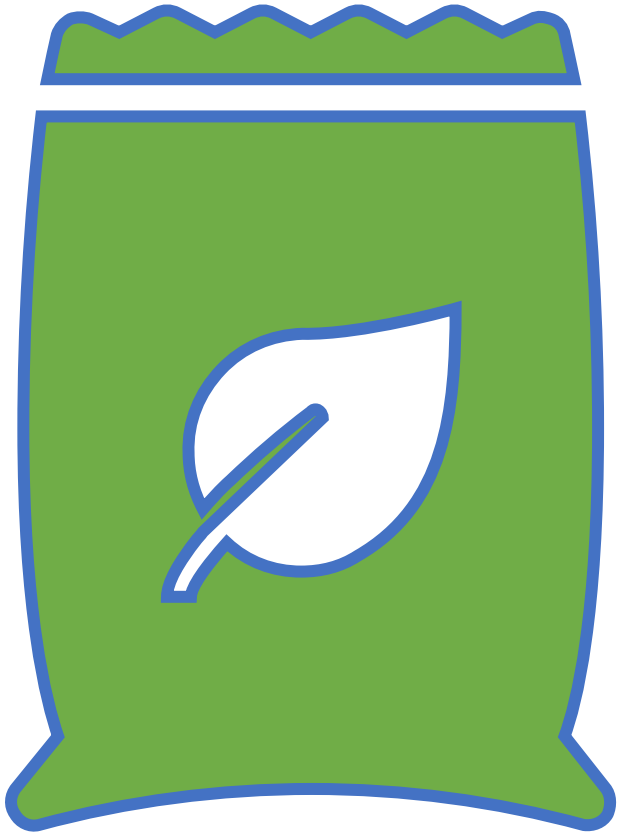
How to Plant Seeds

- The seed packet will also tell you:
  - Spacing between seeds
  - Depth of seeds
  - How to cover seeds
  - Time to germination
    - When the first leaves appear above ground

Where to Plant Seeds

- In the ground
- In a container with soil
- In water, in a hydroponic container
- On a farm where farmers produce
  - Plants
  - Flowers
  - Fruits
  - Vegetables

Video: Planting A Seed



Review

- What do flowers need to produce seeds and fruit?
- Germination begins when a seed first takes in _____.
- Name something in the environment that seeds need to grow.
- Where can you find information about spacing and depth for planting seeds in soil?
- Name two places where you can plant and grow seeds.
- What is the first thing you see above ground when a seed germinates?

Application

- Watch a time time lapse video of seeds sprouting:

Germination of a Radish Seed

- Draw a picture of what you saw in the video.

Extension: Transplanting Seedlings

- If you grow seeds in a container, the seedling or small plant may need to be transplanted to have more room.
- The ideal time to transplant a seedling is when it is small and there is little danger of setback.
  - This is usually when the leaves develop above or between the first leaf or two leaves the seedling produces.
  - The picture shows 4 leaves which makes the plant more viable.

How to Transplant Seedlings

- First dig seedlings out of the planting soil carefully.
  - You can use a fork as shown.
- Dig a hole the same depth the plant was growing in the container.
- Make sure the roots have contact with the bottom of the hole.
- Fill in with soil and gently firm that soil around the plant.
- Water the soil thoroughly.

Next Generation Science Standards

3rd Garde

- **LS1.B: Growth and Development of Organisms** Reproduction is essential to the continued existence of every kind of organism. (3-LS1-1)
- **LS3.A: Inheritance of Traits** Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals' interactions with the environment. Many characteristics involve both inheritance and environment. (3- LS3-2)
- **LS3.B: Variation of Traits** Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) The environment also affects the traits that an organism develops. (3-LS3-2)
- **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to a new location.

Next Generation Science Standards Continued

4th Grade

- **LS1.A: Structure and Function** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

5th Grade

- **LS2.A: Interdependent Relationships in Ecosystems** The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants.
- **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.

Resources

- California Master Gardener Handbook, Pettinger, 2015
- Vegetable Gardening Handbook for Beginners ; UC Master Gardener Program of Contra Costa County; 2015
- Images: Creative Commons; UCANR, UC Master Gardeners of Napa County
- Videos: Mindlapse; UCCE Master Gardeners of Riverside County

Gardening Questions?

- Email or Call the UCCE Master Gardeners of Riverside County
- Email Helpline
  - anrmgriverside@ucanr.edu
- Telephone Helpline
  - 951-683-6491, ext. 232 or 231
- Riverside Master Gardeners Website

University of California
Agriculture and Natural Resources
UCCE Master Gardener Program