

Introduction to Annual and Perennial Plants

Nature does not hurry, yet everything is accomplished.
-Lao Tzu

What are Perennial Plants?

Perennial plants are plants that last two or more seasons. Perennial plantings serve as a foundation for your school garden and can have various purposes such as:

- ❖ attracting wildlife and providing habitat for beneficial insects (pollinators and predators) both of which connect to science content
- ❖ food production (herbs, fruit trees, shrubs, and vines)
- ❖ medicinal uses (teas, tinctures, salves, and balms)
- ❖ ornamental uses (dried floral crafts, cut flowers)
- ❖ providing year round color and foliage
- ❖ providing year round plant material for studying and projects

Perennial plants are usually easier to maintain than annual vegetable crops and, once planted, perennials provide a place of beauty and interest for years to come.

There are many considerations to take into account when selecting perennials:

- ❖ Evergreen vs. deciduous: Do you want a plant that stays green all year or one that drops its leaves in winter?
- ❖ Flowering/fruiting months and colors: It makes most sense to choose plants that will fruit or flower when school is in session.
- ❖ Size and structure: Will the mature size of the plant fit properly in the space available?
- ❖ Uses of plants: Will they be for culinary herbs, ornamental uses, medicinal uses, habitat, food production, special theme or study purposes?
- ❖ Light requirements: Will the plant receive the appropriate amount of light throughout the year?
- ❖ Appropriate climatic zones: Will the plant survive your winter cold?

Climate Zones for Perennial Plants

To determine which plants are suitable for a climate zone, gardeners refer to hardiness charts or “climate zones.” There are two zone charts that are commonly used in the western region:

- ❖ USDA Zones
- ❖ Sunset Western Garden Zones

The USDA Zones range from 1-13, with **1** being the coldest and **11** being the warmest. In California most locations fall between zones **7-10**.

The Sunset Garden Zones are similar to the USDA Zones, but are more detailed allowing for a more specific match of a plant's ideal environmental preferences and a location's climate. There are 24 Sunset zones and the *Sunset Western Garden Book* is an indispensable resource that lists thousands of plants, their zones and growing information for the Western US.

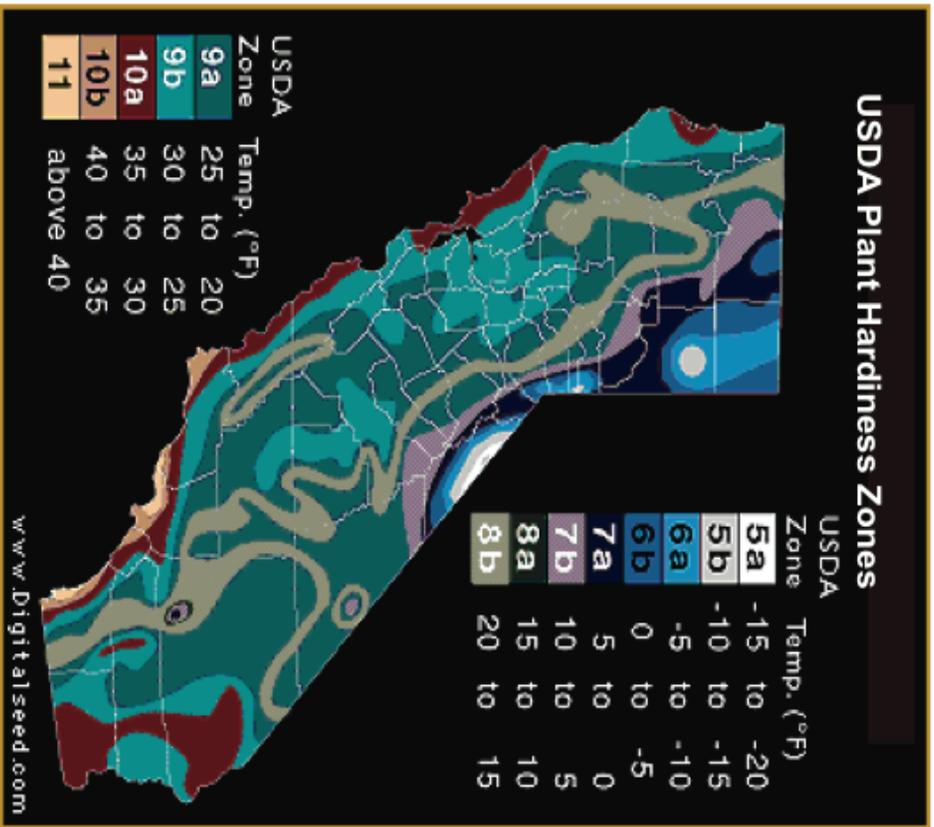
To determine your specific zone, ask a local nursery professional, contact your County Master Gardener (www.mastergardeners.org), or view the "Know Your Zone" maps on the following page. To find out what zone a particular plant will thrive in, refer to the plant label, your nursery professional, or a resource such as the *Sunset Western Garden Book*.

Here are a few more points to consider when planting perennials:

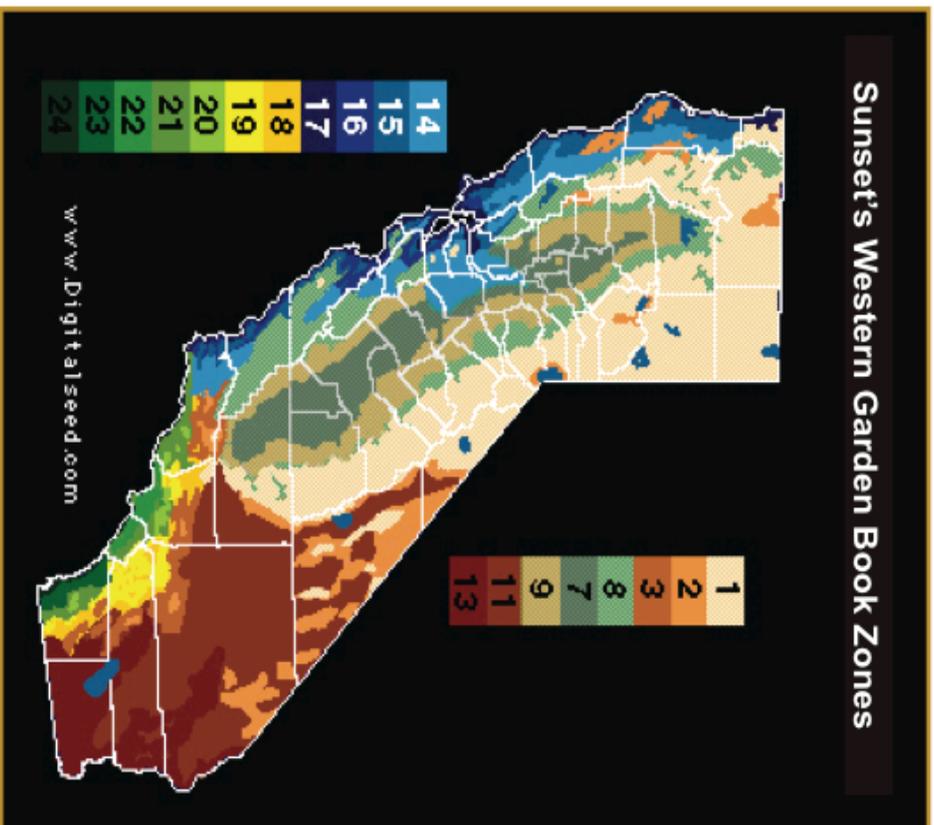
- ❖ “Herbaceous” perennial plants die back to the ground in the winter and re-grow in the spring. “Woody” plants maintain their branching structure during the winter and may be evergreen or deciduous. “Evergreen” perennials keep their leaves during the winter. Keep these characteristics in mind when planning your garden's design.
- ❖ Evergreen perennials can be planted any time of the year, but often the best time of year is in the fall. This allows plants root systems to get established before their growing season and to take advantage of winter rains.
- ❖ Bare root perennials such as fruit trees and vines should be planted in the dormant season (winter or late winter months if your ground is frozen).
- ❖ Most bulbs are planted in the fall for spring blooming dates; they are a great option for school gardens.

Know Your Zone

Cold tolerance or "plant hardiness" is an important consideration when selecting plant varieties for your garden. There are two commonly used climate zones used to gauge temperatures in a particular area. The USDA has established plant hardiness zones for the country. When selecting plants it is important that the plant is suitable for your zone. Zone information for plants can often be found on plant labels or from nursery staff. Sunset's Western Garden Book has created their own zone. Keep that in mind when using their books in garden planning.



http://www.digitalseed.com/gardener/climate/usda_zones.html



http://www.digitalseed.com/gardener/climate/plantclimate_zones

Annual Crop Planning for School Gardens

What are Annual Plants?

Annuals plants are plants the live their whole life cycle (from a planted seed to a mature plant that flowers and fruits and makes a seed again) in a year or less. Annual plants make up most of our vegetable crops, and most of them can be harvested within 2 to 3 months after sowing. Bi-annual plants are similar to annuals but they may live up to two years before coming to the end of their lives.

Annuals are generally classified as either “warm season” or “cool season” crops.

- ❖ **Cool season crops** thrive in cool areas or during cooler months of the year.
 - Generally they are the root, stem, leaf, and flower bud crops.
 - Many of these crops can “over winter” in mild winter areas if planted in the fall, or can be planted in early spring for a late spring harvest.
- ❖ **Warm season crops** thrive in warm areas or during the hotter months of the year.
 - Generally they are the fruit and seed crops.
 - They are often planted in mid-late spring to summer and harvested in the summer and fall.

School Year Planting Options

Cool Season Crops		Warm Season Crops	
<ul style="list-style-type: none"> • Late Summer/Fall Planting Harvest late-fall through winter. • Early Spring Planting Harvest before school ends. 		<ul style="list-style-type: none"> • Late Spring (or Summer*) Planting Harvest when returning to school in fall. (Have a plan in place for summer weeding, watering, and harvest.) 	
Best to sow directly into Garden Beds	Best to plant transplants into Garden Beds	Best to sow directly into Garden Beds	Best to plant transplants into Garden Beds
Beets Calendula (edible flower) Carrots Garlic Nasturtium (edible flower) Onions Peas Radish Spinach	Asian Greens Broccoli Cabbage Cauliflower Chard Collards Kale Kohlrabi Lettuce Nasturtium (edible flower) Onions	Amaranth Corn Cucumbers* Melons Popcorn Potatoes Pumpkins Shelling Beans Snap Beans* Summer Squash* Sunflowers (with edible seeds) Winter Squash	Eggplant Onions Peppers Tomatoes

Average Last (Spring) and First (Fall) Frost Dates in California Cities

From www.victoryseeds.com/frost/ca.html

City	Last Frost	First Frost
Auburn	4/13	11/14
Alturas	7/16	8/9
Bakersfield	3/3	11/20
Barstow	4/15	10/29
Berkeley	1/19	12/26
Bishop	5/25	9/26
Blythe	3/1	11/28
Boca	8/5	7/29
Burney	7/15	8/12
Chico	4/23	10/30
Death Valley	2/11	11/30
Eureka	3/14	11/15
Escondido	3/30	11/12
Fairfield	3/27	11/11
Fresno	4/1	11/7
Klamath	4/27	10/28
Livermore	4/27	11/3
Lodi	3/31	11/2
Lompoc	4/11	11/7
Long Beach	2/11	12/8
Los Angeles	2/11	12/8
Marysville	3/16	11/14
Mineral	7/14	8/7
Modesto	3/28	11/10
Monterey	2/11	12/11
Mt. Shasta	6/13	9/12
Napa	4/28	11/9
Needles	3/2	11/30
Nevada City	6/4	9/24

City	Last Frost	First Frost
Ojai	4/9	11/5
Orick	5/18	10/4
Orland	4/15	11/8
Oxnard	2/9	12/24
Palmdale	5/2	10/27
Palm Springs	3/6	11/18
Palo Alto	3/30	11/9
Pasadena	2/3	12/13
Paso Robles	4/18	10/7
Petaluma	4/25	11/5
Pismo Beach	3/11	12/1
Placerville	5/18	10/22
Pomona	4/1	11/16
Red Bluff	4/2	11/14
Redding	5/10	10/31
Sacramento	3/23	11/14
San Diego	3/30	11/12
San Francisco	1/24	12/8
San Luis Obispo	3/27	11/22
Santa Barbara	2/26	12/4
Santa Rosa	5/1	11/5
Tahoe City	6/30	8/22
Tulelake	7/6	8/14
Ukiah	4/29	10/25
Upland	4/14	11/21
Visalia	3/17	11/8
Willows	4/23	11/8
Yreka	5/31	9/25

Plant Hardiness Definitions

From www.digitalseed.com/gardener/climate/hardiness.html

Hardy Not injured by light frosts and seed will germinate at rather low temperature. May be planted about two weeks to a month before the average date of the last killing frost in the spring. In general, these plants can safely be planted as soon as the soil can be worked into condition. **Includes: onion sets, smooth peas, cabbage plants (well-hardened), kale, kohlrabi, Brussels sprouts, spinach, turnip, radish, asparagus, rhubarb.**

Half-Hardy May be planted about the time of the last killing frost. The seeds of this group will germinate at rather low temperatures, but the young plants are injured by frost. **Includes: lettuce, beet, carrot, chard, parsley, parsnip, heading broccoli, early potatoes, onion seeds, garden peas, celery plants, cauliflower plants.**

Tender Injured by light frost and does not thrive at low temperatures even though frost does not occur. These shouldn't be planted until all danger of frost is past. **Includes: snap bean, tomato, sweet corn, sweet potato.**

Very Tender Does not thrive until the soil has become warm and the seed will rot in the ground unless the soil is warm. **Includes: eggplant, pepper, cucumber, watermelon, muskmelon, lima bean, squash, pumpkin.**

Garden-Enhanced Nutrition Education (GENE)
For additional resources, visit www.csqn.org/gene

Section: Timing for Planting and Harvesting
Introduction to Annual and Perennial Plants

Planting Annual Plants

Gardeners use planting charts (for an example, see *Gardens for Learning* pages 65-68) or the information found on seed packets to determine when to plant annual plants. Most planting charts and seed packets refer to weeks before or after average frost dates as a guide for when to sow seeds or plant (set) transplants outdoors.

The “average last frost date” of the season lands in the late winter or spring. The “average first frost date” lands in the fall or early winter. Planting charts and seed packets will usually instruct you to plant seeds directly into the garden or transplant seedlings a certain number of weeks before a first frost and before or after a last frost.

Contact your local Master Gardeners (found at www.mastergardeners.org) or a local nursery professional, or use *Creating and Sustaining Your School Garden's "Average Last and First Frost Dates in California Cities"* to find out your region’s frost dates.

Planning Your School's Edible Harvest

One of the most challenging aspects of planning a school garden harvest is that most crops are ready for harvest in the summer months, when schools are out of session. With a bit of planning, however, you can create a crop harvest schedule that fits with your school year.

Crop planting charts and seed packets list the “Days to Harvest” of the crop that you are planting. The days to harvest are an approximation of how many days it will take for your plant to go from a newly sown seed to an edible treat. Planning your sowing and harvest dates is as simple as selecting seasonally appropriate crops and noting the days to harvest of the particular crop. Of course there are many other variables like the weather, irrigation, fertilization, and pests that may accelerate or retard a plant's growth, but all of those variables are learning opportunities for gardeners. View the *Creating and Sustaining Your School Garden Crop Harvest Planning Chart* for specifics on planning a school year harvest.

Once you have chosen which crops to plant, read the *Creating and Sustaining Your School Garden Vegetable Planting and Harvesting Tips*, or refer to an online planting guide at www.csgn.org/crop-planning to learn more about growing and harvesting your crops.

Planning a Fall Harvest

One mistake many new school gardeners make is planting a garden that matures during summer while students are away. In order to plant vegetables that are ready to harvest in the fall, plant longer “days to harvest” vegetable varieties and plant them in the late spring or early summer. Read the “days to harvest” listing on the back of seed packages and plan accordingly.

Another suggestion is to plant crops that can dry in the garden like popcorn, winter squash (pumpkins), or shelling (dry) beans. Popcorn can dry in the field for weeks once mature, whereas sweet corn needs to be harvested within a week or two for a tasty harvest. Also remember that many fruiting vegetables need to be harvested to keep producing throughout the summer, so make sure your summer garden guardians harvest regularly to encourage continual fruiting.

Try planting some of these crops in late May or June and come back to school with something to harvest.

Shelling Beans (dry beans)	Peppers
Sunflowers (Edible or Birdseed)	Eggplant
Winter Squash	Melons
Popcorn	Tomatoes
Pumpkin	Parsnip
Potatoes	Health Master Carrots
Amaranth	

Edible Theme Gardens

Many successful school garden programs have learned that planting an edible theme garden is a good way to pique students' interest, grow healthy food and connect to the classroom via cultural studies. For example, the Native American **Three Sisters Garden** demonstrates the interdependence of corn (which uses nitrogen added to the soil by the beans), beans (which grow up the corn stalks), and squash (which covers the ground and reduces weed growth). Another popular example is a **pizza garden**, in which everything needed to make a pizza can be grown (add a statue of a cow to represent the source of cheese and a pig the "pizza meat" animal). Other ideas of edible theme gardens include salad, soup, stir-fry, salsa, and snack garden (fresh eating crops).

Crop Harvest Planning Chart

Plant carrots in January and you'll never have to eat carrots.

~ Author unknown

Average Frost Dates

Most seed packets and planting guides recommend the number of weeks to plant or transplant (set out plants) before or after the average first or last frost date in your area. Refer to the average frost date chart and write your average frost dates below:

Last Frost (Spring):	First Frost (Fall):
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2012

January	February	March	April
Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
May	June	July	August
Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
September	October	November	December
Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

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Planning Planting and Harvest Dates

1. Review the school year planting options list for a summary of school year planting/harvest windows.
2. With your average frost dates noted refer to a seed packet or planting guide for more specific details on when to plant.
3. Use a seed packet or planting guide to find the **number of days until harvest**. "Days to Harvest" are based on the day that the seed is first put into soil (container or direct sown).
4. Chose a crop and fill out the chart below selecting a harvest date when school is in session.

Crop	Planting Date	Number of Days to Harvest	Target Date for Harvest
<i>Example: Lettuce</i>	<i>March 10th</i>	<i>50 days from direct seed</i>	<i>April 30th</i>

Keep in mind the weather and a number of other factors can affect the number of days to harvest. If you are planting a transplant, you can subtract about 20-30 days off the "days to harvest" found on seed packets and planting guides. Note: some seed packets (such as tomatoes and peppers) state the days to harvest from setting out a transplant.