

GARDENING 101

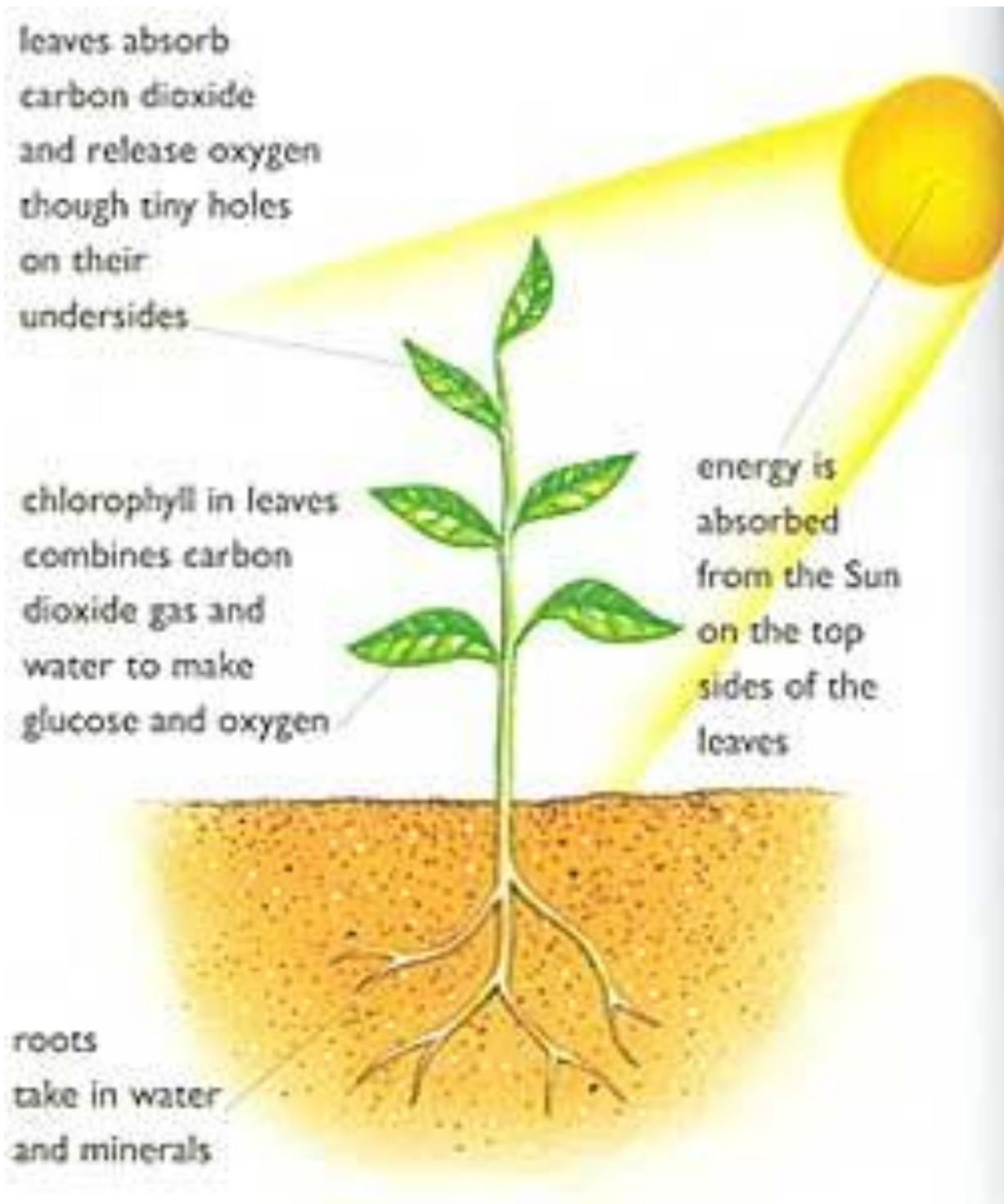
HOW PLANTS LIVE AND GROW:

leaves absorb
carbon dioxide
and release oxygen
through tiny holes
on their
undersides

chlorophyll in leaves
combines carbon
dioxide gas and
water to make
glucose and oxygen

energy is
absorbed
from the Sun
on the top
sides of the
leaves

roots
take in water
and minerals



Photosynthesis is a plant's ability to internally manufacture its own food; specifically forming carbohydrates from carbon dioxide and a source of hydrogen (usually water) in the chlorophyll-containing cells (foliage of green plants) exposed to light. This ability is the major difference between plants and animals.

Topsoil has four principal components: air, water, mineral (weathered rock fragments), and organic matter such as decomposed plants. All healthy soil is full of life. A quarter teaspoon of topsoil can contain a billion microorganisms (bacteria, fungi, and algae) that help break down the remains of plants and other organisms to release energy and nutrients into the soil. Soil texture is determined by the mineral particles, which are a combination of sand, clay, and silt. Sand particles are the largest and clay particles are the smallest. Silt are medium sized. In sandy soil, water and nutrients run through too quickly, so plants in sandy soils need watering more frequently, and more added nutrients. Clay soil is often dense and compacted, making it difficult to work and hard for plant roots to grow because the movement of air and water is slowed. Water runs off or pools rather than infiltrating and draining through. The best soil texture for most plants is called loam, which is medium textured with less than 27% clay.

Nutrients The essential nutrients for plants are N (nitrogen) for green growth; P (phosphorus) for roots and blooms; and K (potassium) for strength. There are many other beneficial nutrients found in fertilizers which can be organic (i.e.: composts) or synthetics.

Compost is decomposed organic matter that provides essential nutrients. It also helps correct both overly sandy and clay soils by eventually turning them into loam. Most plant roots are located in the top 6-9" of soil, so that is the most critical area. Compost is spread on top of existing beds and lawns annually. 2-3" is good for beds. 1/4" on existing lawns. It continues to decompose, sinking down quite rapidly into the existing soil.

Mulch is organic or inorganic material that helps retain moisture and reduce unwanted plants ("weeds") but does not usually add significant amounts of nutrients. Bark is the most common mulch material. Keep any kind of mulch at least 6" away from stems to avoid stem rot from excessive water. Rake back before adding compost.

pH is a measure of soil acidity. A soil's acidity is determined by rainfall. The greater the rainfall, the more acidic the soil. Neutral pH is 7.0. A soil with a pH lower than 7 is an acidic soil; higher than 7 is an alkaline soil. Soil acidity determines the availability of mineral nutrients for the roots of your plants. Most soil in Western Washington is between 5 and 7 pH. Plants grown in soil with a lot of organic matter have healthier roots. They're able to extract enough nutrients from the soil even when the pH isn't optimal. You can raise the pH for alkaline loving plants like peonies and lilacs by adding lime annually to their surrounding soil.

Water - the 1" per week year round rule applies to most plants. Drought tolerant plants can survive longer once they have established root systems. Roots usually take at least two growing seasons to establish.

Light Conditions

Different plants thrive in different light conditions.

Full Sun means 6 or more hours of direct sunlight during the growing season

Partial Sun means less than 6 hours of direct sunlight during the growing season; including any mid-afternoon sun

Partial Shade means 2-4 hours of direct sunlight, but not in the mid-afternoon

Filtered Sun/Shade means 6 or more/less than 6 hours of direct sunlight filtered through the canopy of taller trees/shrubs

Full Shade means 2 hours of less or direct sunlight and it's not in the mid-afternoon

DEFINITIONS OF COMMON PLANT TERMS:

Tree - a woody stemmed plant that normally gets more than 12' tall at maturity

Shrub - a woody stemmed plant that normally doesn't get more than 12' tall at maturity

Herbaceous - a soft stemmed, non-woody, plant

Maturity - size of a plant when its normal rate of growth has slowed way down. No plant ever stops growing completely until it dies. Beware - most plant tags tell you how big a plant will likely be when it is 10 years old, rather than at maturity. Life spans and growth rates vary considerably.

Evergreen - most of the foliage remains on a woody stemmed plant year-round. Some of the oldest foliage dies and falls off, more or less continuously, throughout the year.

Deciduous - all foliage drops off the woody stemmed plant more or less at the same time, usually in the fall, every year and reappears at the start of the next growing season.

Conifer - an evergreen or deciduous shrub or tree with needles for foliage

Broadleaf - an evergreen or deciduous shrub or tree with leaves for foliage

Perennial - an herbaceous plant that dies back completely to the ground at the end of the growing season, but returns again year after year at the beginning of the next growing season. There are a few hardy perennials that don't die all the way back here in the PNW, except in severe winters.

Biannual - an herbaceous plant that dies back completely at the end of the first growing season, but returns for one more season; they usually only bloom in the second year.

Annual - an herbaceous plant that lives for only one growing season. Note: Plants that are perennials in one area or year might be annuals in a colder area or year and vice versa.

Central leaders - Some woody plants have one main stem and all other stems branch off from it. That main stem is called a central leader.

Multi-stem - These woody plants have multiple stems coming up from ground level which vary in thickness depending on their age.

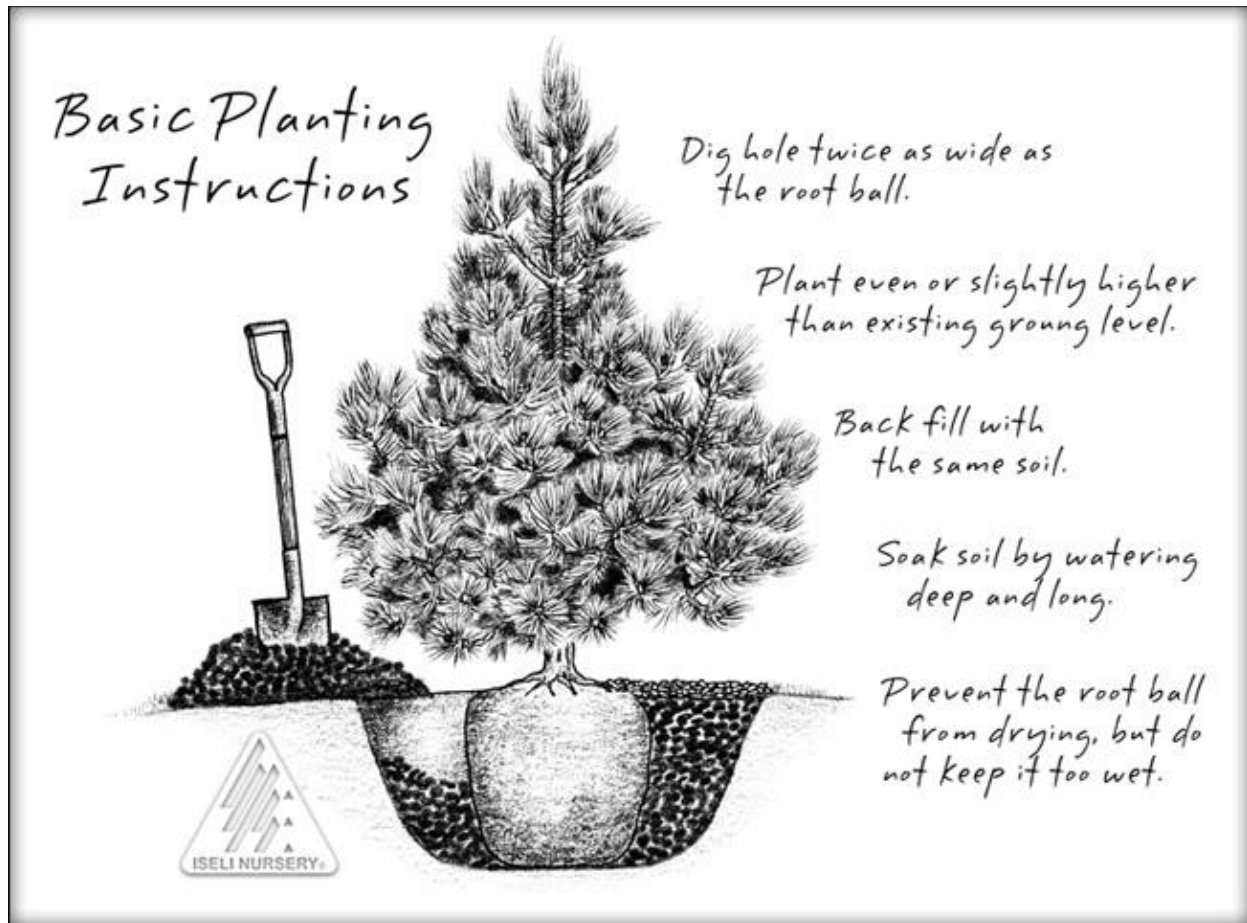
Nodes are the points on a stem where the buds, leaves, and branching twigs originate. They are crucial spots on the plant where important healing, structural support, and biological processes take place. Nodes are not all created equal: some nodes have mature branches, some have just dormant, ungrown buds, and there are all kinds of growth in between.

Internodes are the sections of stem between nodes. The size of the internodes is a good indicator of how big a variety of a plant is likely to get at maturity. The longer the internode, the bigger the plant.

PLANTING

Hole and soil preparation:

Dig the planting hole a minimum of twice the width of the root ball but no deeper. The depth of the hole should allow solid ground below the root mass resulting in the root flare at the top of the root mass to be slightly higher than the finish grade of the planting. The soil must have good drainage. Amend the soil that is removed from the hole with compost or good potting soil at a ratio of 1 shovel full to 3 of soil; blend well. This is especially important when it is clay soil.



Planting B&B (balled & burlap):

After the hole has been prepared, remove the wire and/or string and any other synthetic material from around the rootball. Place the tree in the planting hole. Feel the top of the root ball and be sure the root flare is slightly above ground. Begin back filling with the amended soil. Water well before completely filling the hole to remove air pockets then water again after the planting is complete. Do not cover the root ball with more than 2" of mulch. Doing so could suffocate the plant. Keep mulch at least 6" away from the trunk. It is best to stake larger trees to keep them from tipping or blowing over.

Container grown:

Before planting, carefully loosen the roots all around the root ball. If the plant is root bound use a knife or shears to loosen up the root mass on sides and bottom. Place plant in the prepared hole being sure the root flare is slightly above ground. Begin filling in around the plant with the

amended soil. Water well before the hole is filled to remove air pockets then water again when the planting is complete. Apply no more than 2" of mulch on top of the root ball being sure it does not get within 6" of the bark of the plant.

WATERING

Before planting, water your plant daily until planting time. Do not allow your plant to dry out. After planting, adjust your watering to the climate. During summer/dry weather, water deeply once or twice a week, slowly soaking the area around the plant to a depth of 4". It usually takes about an inch of water to do this. Do not over water. If the soil is wet, do not add water. In the first summer, it can be beneficial to contain water by creating a slight "well" around the plant so the water can't run off. Once the plant is established or prior to heavy rains return the soil around plant to natural grade so the plant does not drown in a mini pond.

FERTILIZING

When you fertilize new plants, make sure to use a starter or slow release or organic product, insuring protection for tender new root growth. In the spring of the following season a fertilizer for mature plants may be used if your soil requires additional nutrition. Never allow fertilizer to contact plant foliage as it may burn the plant and cause severe dieback.

PRUNING

Plants are living, breathing beings. They have specialized cells/organs that perform all the essential functions to maintain life. Every plant has a mature size it will keep trying to reach - the more you prune, the more it will try to grow, frequently in undesirable directions. They can get hurt and go into shock, and are susceptible to diseases and insect infestations, especially when weak from trauma. Many, but not all, pruning chores can be avoided by planting the right plants in the right places.

What to prune:

The 4Ds - dead, damaged, diseased, and deranged

When to prune:

dead, damaged, diseased - whenever you see it

deranged - late in dormant season except spring bloomers, prune them immediately after bloom is finished.

Where to prune:

Central leaders - Only side branches can be pruned, pruning a central leader will create a permanently deranged plant. The 1/3rd rule applies: Never remove more than 1/3 of the foliage in one growing season or the plant may not be able to feed itself (in-adequate photosynthesis)

Multi-stem - All branches on these plants can be pruned, usually to the lowest node. Start by removing the thickest branches to control overall height and width (the 1/3rd rule applies)

How to prune:

When you prune, you should virtually always be cutting back to a node. You are trying to make a clean cut through the part of the internode located just above a node. You never want to cut through the node itself because this would likely kill that important spot where healing and regrowth is supposed to start. Make sure your tools are clean and sharpened.

Kinds Of Pruning Cuts

Thinning cuts go back to a strong node that can take over growth without shock or interruption. The result is an airier, more open branching pattern. A strong node usually supports another side branch at least 1/3rd the diameter size of the branch being removed. One bit of confusion is that “thinning” is also used to describe the practice of removing fruit from a plant to increase the quality of the remaining fruit.

Heading cuts preserve the lateral buds and generate new growth (side shoots), filling in the interior of multi-stemmed plants. Heading back can also be used to keep a multi stem shrub within bounds (as when you have a plant in a spot way too small for it) or to alter its shape. If you cut above a bud facing away from the center of the shrub it will generate growth in that direction, useful whenever you are trying to correct the shape of a bush that has suffered damage or that has not been properly cared for in the past. Never make a heading cut on a central leader, as the plant will become permanently deranged, as well as more susceptible to disease and insects.

Pinching requires no tools (such as pruners). Instead, you literally "pinch" off the growth at the top of a plant's stem, using your fingers. For example, we commonly pinch annuals and perennials up to a certain point in the summer, to keep them bushier and encourage more blooms.

Shearing is most commonly practiced on topiaries and hedges to keep growth within the desired bounds or make the hedge as dense as possible by stimulating new growth. If you have a choice, choose hedge plants that will not outgrow the allotted space as shearing disfigures all but the tiniest leaved plants.