Apical dominance of vertical tip buds

Shoots at flatter angles are less apically dominant at tip

How a Tree Grows
Vertical

Tip bud generates hormone

Shoot growth reduced progressively from tip to base

Zone of spur development
Limb Angle Regulates Growth

- Vertically positioned shoots have strong vegetative growth but produce fewer fruit buds.
- Horizontally positioned shoots have weaker growth at the tip but produce more fruit buds.
Fruit buds (spurs) develop on branches in a more horizontal position.

New 1-year shoots
End shoot is strongest

Fruit spurs on 2-3 year branch
Why Prune?

- We prune to open light channels
- Good light channels throughout the tree enhance tree health and improve fruit quality
- We prune to keep the tree in balance
Two types of pruning cuts

- **Thinning** – cutting out a whole branch or shoot back to its origin
- **Heading** – cutting off part of a branch or shoot
Thinning cuts take out entire branches or shoots
Heading cuts take off part of a branch or shoot
Thinning Cuts

- Open light channels
- Increase fruit production and quality
Heading Cuts

- Tend to close off light channels
- Decrease fruit production
Thinning vs. Heading: Results
BEFORE PRUNING
A-B  Remove water shoots
C   Head back drooping laterals

AFTER PRUNING - 1st Year
REGROWTH
One year after 1st. pruning

PRUNING for annual maintenance
Thin shoots as you would thin a corn patch
Space the shoots to let in light and air
INCORRECT PRUNING
Shoots headed to stubs

RESULT - Mass of unproductive shoots
Why head at all?

- To stiffen or shorten a branch
- To increase branching
Heading to stiffen or shorten a long branch
Branch is headed and upper branches reduced to prevent shading of lower areas in tree.
Development of unheaded shoot vs. headed - heading stimulates branching at the cut.
Old neglected tree full of old water shoots
After removing water shoots – better light to tree, easier access
Compare the tree on right, after corrective pruning, to the unpruned tree at left.
Pruning principles are the same for both dwarf trees and standard size trees.
Establish your scaffold limbs at their permanent height above ground.
The scaffold limbs become the main permanent structure of the mature tree.
No more than 4-5 main branches form the lower scaffold.
Weaker branches can be tied up at a more vertical angle to increase vigor.
Large diameter branches should be in the bottom of the tree and kept open to light.
TOP VIEW
A- ladder bays
B - shoot growth to fill in spaces
C - new shoot trained to replace weak branch
Keep ladder bays open by removing crowded branches.
After opening ladder bays, there is more space and light access.
Remove upright shoots that close light channels between branch tiers
Small weaker branches should be in the top of the tree

To let in light throughout the tree
Before Pruning
After Pruning showing spacing between scaffold tiers
Keep upper branch diameter smaller to prevent shading in the lower limbs.
Open Center Pruning for Most Stone Fruit
Peach branch on Open Center Scaffold before pruning
Remove shoots that are too vigorous particularly at the terminal ends of branches.
Remove shoots that grow into the center of the tree.
Thin out shoots that are crowded together.
< Before pruning

Pruning completed
Limb positioning is very important for branch vigor and fruit management.
Young apple tree before spreading
Limb spreading to 45° angle using tie-downs
Spread a vigorous young tree like this before you prune.
Inserting spreaders encourages earlier fruit production. Spreaders can usually be removed 4-6 weeks after growth starts.
Young cherry tree tied down with ground anchors.
Same tree 4 years later.
Summary

- Start young trees out with a strong framework of scaffold limbs
- Maintain good exposure to light throughout the whole tree
- Don’t let the top outgrow and shade the lower limbs
- Make most of your cuts thinning cuts
- When in doubt, thin it out!