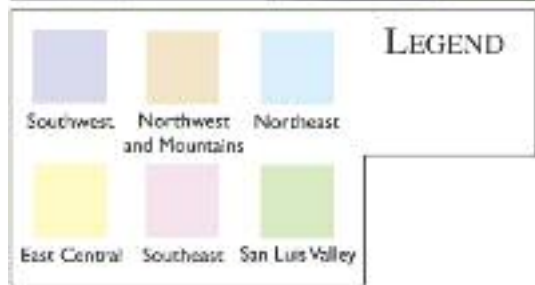
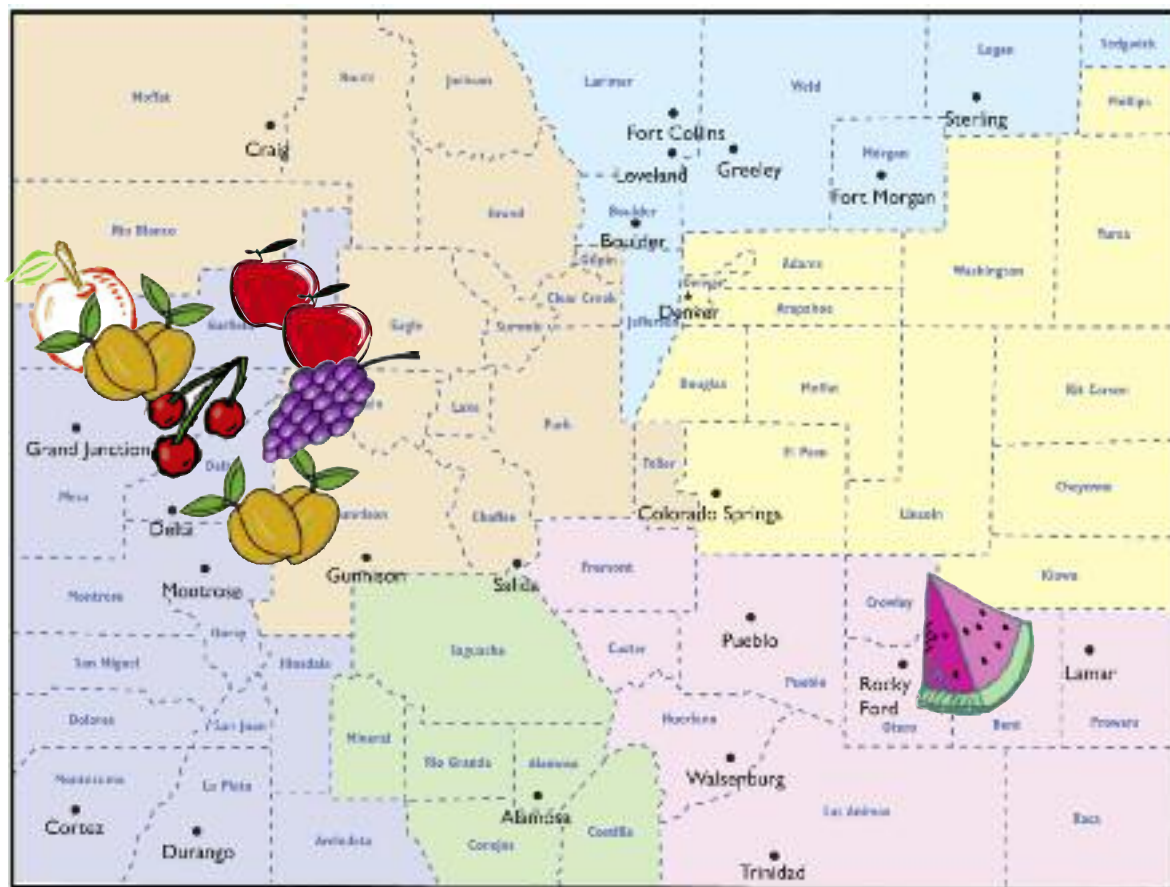


**SPECIALTY CROPS: FRUIT**



# Colorado Reader

AG in the Classroom — Helping the Next Generation Understand Their Connection to Agriculture  
 Colorado Foundation for Agriculture ~ [www.growingyourfuture.com](http://www.growingyourfuture.com)



**Colorado:  
 peaches,  
 apples,  
 grapes  
 and more!**

Colorado's fruit growing region centers on three counties on the Western Slope: Delta, Mesa and Montrose. Melons grow in the Arkansas Valley around Rocky Ford in Southeastern Colorado.

Peaches, apples, cherries, plums, apricots and pears make up the bulk of the harvest from Western Slope orchards. Grapes for wine also grow well in the Grand Valley between Grand Junction and Palisade.

Cherries are ripe in mid-June. The other tree-grown fruits follow in August, September and October. Grapes are ready in September. Cantaloupe harvest begins in mid-August. Watermelons are ready in September.

Apples are Colorado's largest fruit crop. Commercial varieties include Red Delicious, Jonathan, Golden Delicious, Gala, Fuji, Rome, Akanes, Jonagolds, Braeburns, Honeycrisps, Cameos, Granny Smiths and Suncrips.

Melons are grown for their fruit and for seeds. Seeds are shipped worldwide.

Wineries convert wine grapes to wine. There are now over 100 wineries in Colorado, most of which started within the past 10 years.

# Colorado is peachy!



Colorado's climate influences which foods grow where in the state. Colorado is semi-arid. The average precipitation each year is about 14 inches.

Statewide, the sun shines more than 300 days a year. This holds true in the high mountains and on the plains.

The high mountains are too cold for a good crop of fruit. The front range, the

Colorado Plateau and plains experience weather that is too extreme to reliably grow fruit crops.

The map on page 1 is laden with fruit on the Western Slope. This area combines low humidity, warm daytime temperatures and cool nights. There is less tendency to have the extremes that occur at both higher and lower altitudes. Delta, Mesa

and Montrose counties have areas where everything comes together and is "just right" for fruit to mature and ripen.

## What goes around comes around



We seem to be traveling in circles. Not so very long ago, people ate what they could grow and what their neighbors could grow. Then along came automobiles and it became easier to carry items over distances. Trains and trucks and interstate highways meant more goods could be carried even further. It could be done fairly quickly.

People added airplanes into the transportation system. Having a choice of ships, trucks, trains and planes means we can have fresh produce all year. We can eat what another state or another country grows. The result is more diversity in our foods without regard to the seasons.

Interestingly, the last few years have seen a resurgence of eating locally grown foods. This is a result of people's attempt to decrease their reliance on using gasoline. There are also health benefits to eating locally grown foods and produce. The

catch is that you might find yourself eating a lot of peaches in September but not so many in March. Canning, freezing and preserving are ways to extend the time frame in which foods are available. Fruit growers provide the fruit and often provide fruit products like cider or applesauce.

In a way, some people are recreating the good old days. Farmer's Markets are thriving across Colorado. The peach from Farmer Joe's orchard has a taste that keeps people returning for the homegrown touch.

Transportation also means the fruits grown in Colorado can reach far flung locations while they are in their prime. One result is that Colorado ranks 5th in the nation for cantaloupe production, 7th for peaches and 8th in pear production.

Almost one out of every four apples harvested in the United States is exported.

WHERE ARE  
ORANGES



AND  
GRAPEFRUIT?

THESE ARE  
CITRUS FRUITS. THEY  
GROW BEST IN  
SUNNY, HUMID  
ENVIRONMENTS WITH  
LONG GROWING  
SEASONS.

COLORADO IS NOT  
HUMID & WINTER PUTS  
A HALT TO OUR  
GROWING SEASON.  
FLORIDA AND  
CALIFORNIA ARE  
BETTER GROWING  
AREAS FOR CITRUS  
FRUITS.

- Colorado Academic Standards. This issue of the *Colorado Reader* helps you achieve the following Colorado Academic Standards.
- **MATH** Standard 1: Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.
- **MATH** Standard 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.
  - Benchmark 1: Construct, read, and interpret displays of data including tables, charts, pictographs, and bar graphs.
- **MATH** Standard 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.
  - Benchmark 3: Demonstrate the process of measuring and explaining the concepts related to units of measurement
- **READING, WRITING and COMMUNICATION** Standard 1: Students read and understand a variety of materials.
  - Benchmarks: Use a full range of strategies to comprehend a variety of texts, such as non-fiction, rhymes, poems, and stories.
- **SCIENCE** Standard 2: Physical Science: Students know and understand common properties, forms, and changes in matter and energy. (Focus: Physics and Chemistry) Students know and can demonstrate understanding that:
  - Benchmark 1: Objects have physical properties that can be measured (for example: length, mass, volume and temperature)
- **SCIENCE** Standard 3: Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. (Focus: Biology - Anatomy, Physiology, Botany, Zoology, Ecology)

The *Colorado Reader* publication and Ag in the Classroom are projects of the Colorado Foundation for Agriculture. Educational projects are produced in cooperation with the Colorado Department of Agriculture, other state and federal agencies, Colorado commodity groups, Colorado agricultural associations, state universities and colleges and interested individuals. The *Colorado Reader* is provided free to educators requesting them. For more information contact: Bette Blinde, Director, Colorado Foundation for Agriculture, P.O. Box 10, Livermore, CO 80536 or phone (970) 881-2902.

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Special thanks to contributions of information and photos by Colorado orchard growers: Jonathan Allen and Kevin Kropp from Paonia; Skip Dennis and Charlie Talbott from Palisade.

# An apple a day...

There are five food groups. It is important to eat foods from each group every day. That's because no one food has all the nutrients you need.

Fruits may be fresh, canned, frozen or dried. Choose whole or cut up fruits. Fruit juice, especially fresh squeezed, is good. Fruits can be used for snacks, in salads or made into desserts.

Eating fruit provides health benefits — people who eat more fruits and vegetables as part of an overall healthy diet are likely to have a reduced risk of some chronic diseases. Fruits provide nutrients vital for health and maintenance of your body.

## HEALTH BENEFITS:

- Reduce risk for heart disease, including heart attack and stroke.
- Protect against certain types of cancers.
- Reduce the risk of obesity and type 2 diabetes.
- Lower blood pressure and may also reduce the risk of developing kidney stones and help to decrease bone loss.
- Lower calorie intake.

## NUTRIENTS:

- Most fruits are naturally low in fat, sodium, and calories. None have cholesterol.



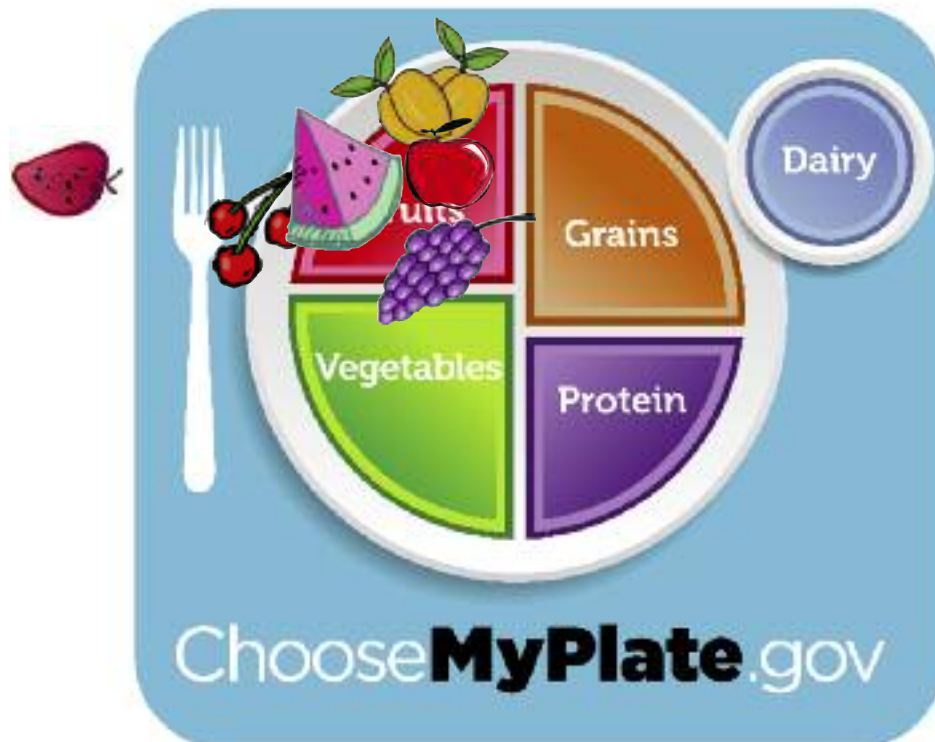
- Fruits are sources of many essential nutrients that are underconsumed, including potassium, dietary fiber, vitamin C, and folate (folic acid).
- Diets rich in potassium may help to maintain healthy blood pressure. Fruit sources of potassium include bananas, prunes and prune juice, dried peaches and apricots, cantaloupe, honeydew melon, and orange juice.
- Dietary fiber from fruits, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as fruits help provide a feeling of fullness with fewer calories. Whole or cut-up fruits are sources of dietary fiber; fruit juices contain little or no fiber.
- Vitamin C is important for growth and repair of all body tissues, helps heal cuts and wounds, and keeps teeth and gums healthy.
- Folate (folic acid) helps the body form red blood cells.

## WHAT'S ON YOUR PLATE?




Check off your favorite fruits and add more choices.

### FRUITS

- orange juice
- watermelon
- strawberries
- bananas
- grapes
- cherries
- apples
- peaches
- plums
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



# COMPARISONS

Food substance = 100 g.	energy kJ/Kcal	water %	fiber g	fat g	protein g	sugar g	vit.A µg	vit.C mg	vit.B1 mg	vit.B2 mg	vit.B6 mg	vit.E mg
Apple 	207/49	84	2.3	0	0.4	11.8	2	15	0.02	0.01	0.05	0.5
Apricot	153/36	87	2.1	0	1.0	08.0	420	5	0.06	0.05	0.06	0.5
Blueberry	204/48	80	8.4	0	1.0	11.0	0	10	0.02	0.03	0.05	1.9
Blackberry	170/40	85	8.7	0	2.0	08.0	30	150	0.08	0.04	0.07	1.0
Cherry 	221/52	86	1.2	0	0.0	13.0	40	10	0.02	0.02	0.04	0.1
Grapes	274/64	83	2.2	0	0.6	15.5	0	3	0.03	0.01	0.08	0.6
Melon, Red Water	153/36	93	0.6	0	1.0	08.0	30	6	0.04	0.05	0.07	-
Melon, cantaloupe	122/29	89	0.6	0	0.9	06.3	7	32	0.05	0.02	0.10	0.2
Peach 	151/36	89	1.4	0	1.0	07.9	15	7	0.01	0.02	0.02	0.0
Pear	201/47	86	2.1	0	0.3	11.5	0.0	4	0.01	0.01	0.02	0.1
Plum	177/42	84	2.2	0	0.8	09.6	18	5	0.02	0.03	0.10	0.7
Strawberry	99/23	91	2.2	0	0.7	05.1	10	60	0.02	0.03	0.06	0.4
Tomato	48/11	97	1.4	0	0.9	01.9	140	15	0.05	0.02	0.08	0.7

## Reading the Table

Source: Nevo table 1996, Nevo Foundation, Netherlands Nutrition Centre

The table shows nutrient content of specific fruits. It also shows how much of the fruit is water. These measurements are based on the fruit weighing 100 grams.

The most cryptic entry is for energy. Food energy is the amount of energy obtained from food. It can be expressed in food calories or kilojoules (kJ). The Kcal stands for kilocalorie or a large calorie (as opposed to a small calorie).

It works out that if you eat 49 calories of apple you will get 207 kilojoules of energy. We'll boil it down to calories create energy. Calories create the same amount of energy but foods provide unique numbers of calories. Therefore some foods provide more energy than others.

To read the table you need to know that the first number under energy is the amount of energy the food produces. This is followed by the number of calories in an average sized piece of fruit.

The rest of the table shows how much of which nutrients you get when you eat those calories.

One of the reasons to gather up a bunch of information and put it in a table or a chart is to be able to make comparisons. Comparisons of content can be expressed by using phrases like less than, equal to, more than. Let's give it a try. In addition to answering the question, write a statement on the red line using a comparative word or phrase.

Which fruit contains the largest percentage of water? \_\_\_\_\_

What fruit from the table would you include in your diet if you want to increase the amount of Vitamin A you get? \_\_\_\_\_

All the fruits listed contain Vitamin C.

What is the difference between the fruit containing the most Vitamin C and the fruit containing the least amount of Vitamin C? \_\_\_\_\_

Fiber is a good thing to have in your diet. What are the top three fruits in the chart for getting fiber?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



Which foods are good to eat if you embark on a low fat diet? \_\_\_\_\_

Which fruit listed in the table has the most calories? \_\_\_\_\_

Correspondingly, which nutrient does that fruit contain more of than any of the other fruits? \_\_\_\_\_

Growing kids need to be eating as many as 2000 calories a day. That's so you get all the nutrients your body and mind need as you are charging toward adulthood.

The second important thing that you need is exercise. The people who know and measure these things say children and adolescents are encouraged to do 60 minutes or more of physical activity each day. They go on to say it needs to be moderate or vigorous exercise: running, skating, bicycling. You'll really have this exercise thing worked out if you add in some kind of muscle strengthening activity: climbing, for instance, and bone strengthening exercises like jumping rope three days a week.

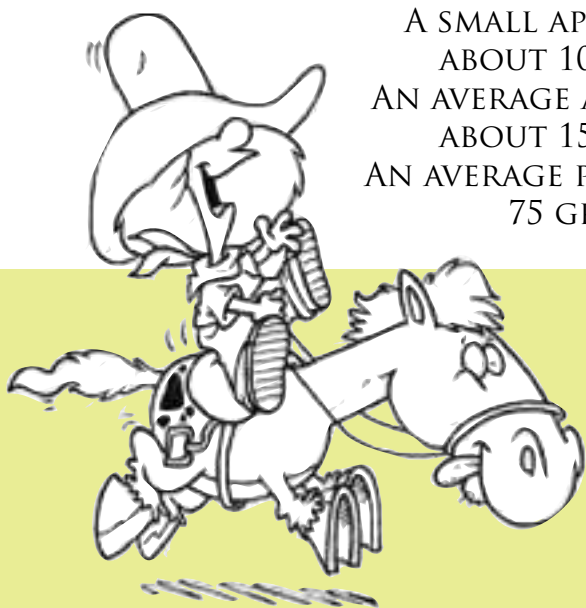
That's quite the assignment.



# Let's Get Movin'

Here are the number of calories used by certain activities. The calories in this table are based on someone who weighs 80 pounds. And the length of time the activity is sustained is 30 minutes.

Fill out the table. Figure out how many grams of apples you can eat to balance calories and activity (get as close to zero as you can!) Do the same calculations for strawberries to complete the third column.



A SMALL APPLE WEIGHS ABOUT 100 GRAMS.  
AN AVERAGE APPLE WEIGHS ABOUT 150 GRAMS.  
AN AVERAGE PEACH WEIGHS 75 GRAMS.



ACTIVITY: Calories	APPLES	STRAWBERRIES
playing a game of basketball: 154 calories		
bicycling, kind of fast: 192 calories		
playing frisbee: 58 calories		
jumping rope: 192 calories		
running/jogging: 173 calories		
walk/jog: 115 calories		
lawn mowing: 86 calories		
children's games (4-square, etc.): 96 calories		
raking lawn: 77 calories		
shoveling snow: 115 calories		
reading (sitting): 18.1 calories		
sleeping: 16.3 calories		
watching tv: 18.1 calories		
sitting in class: 32.7 calories		
swimming: 109 to 181.8		
softball: 90.9		
sledding: 127.2		

Some of the measurements in the table are really, really small measurements.

Analyze this number: 17.68

Which number is in the tens place? \_\_\_\_\_

Which number is in the ones place? \_\_\_\_\_

Which number is in the one-tenth place? \_\_\_\_\_

Which number is in the one-one hundredth place? \_\_\_\_\_

Is 17.68 greater than or less than 17.78?

<       >

I wonder what happens if we change from measuring quantity to measuring time? You'll be seeing times measured in hundredths of seconds during the Olympics and other timed sporting events.

Is 17.68 faster or slower than 17.78?

faster       slower

# What kind of fruit is that?



**Apples** are round fruit with firm juicy flesh and green, red or yellow skin. They contain a lot of fiber. The Vitamin

C content of an apple depends on what kind it is, but generally all apples contain a lot of this important nutrient. An average apple contains 75 calories. Apples are eaten raw, cooked, made into sauce, desserts or dried.

**Apricots** are round stone-containing fruit with soft flesh, Apricots are related to the plums and peaches. They are orange-yellow when ripe. This little fruit contains a lot of vitamin A and kalium. Apricots need to be picked when ripe. They don't store well so need to be eaten immediately. A lot of jam is made out of apricots. They are also dried or frozen.

**Cherries** are native in Europe. These are small soft round fruit, red or black when ripe and they contain a stone. Cherries always have to be picked ripe. They do not ripen well after they have been picked. Cherries are good for one to three days. They can be made into jelly. The stones need to be removed before freezing or you'll be struggling with them.



**Peaches** are round juicy fruit with downy yellowish-red skin and a rough stone. Peaches are from Chinese origin and go way back in history. The fruit has yellow or whitish flesh and a delicate aroma. Some varieties of peaches have the stone fixed to the pulp (clingstones) and others grow with a loose stone (freestones). Skin color varies from green to dark-red. Peaches have downy skin. An average peach weighs 150 grams or 6 ounces. Peaches help make the skin healthy and are a good source of Vitamin A and fiber.

**Nectarines** are a type of peach with a thin smooth skin and firm flesh. Peaches and nectarines need to be picked ripe. They do not ripen well after being picked. Peaches and nectarines keep for one to three days but with just one small bruise the fruit will go bad. Both of these fruits taste best eaten directly from the tree. Jam is a result of the short shelf life of peaches and nectarines.

**Pears** are sweet juicy yellow or green fruit with a rounded shape that becomes narrow towards the stalk. Pears are picked when they are almost ripe. They ripen at room temperature but can be kept up to a month in a dark place. There is a fruit called a quince. A quince is a pear-like fruit that can only be eaten cooked. Normal pears are mostly eaten raw and make great desserts. Pears contain kalium and riboflavin and are a good source of fiber.



**Plums** are soft round smooth-skinned sweet fruit with sweet flesh and a flat-tish pointed stone. There are many varieties. They will store for a few days in a dark, cool place. They can be dried. Plums are used for juice, jam and syrup. This fruit is high in carbohydrates, low in fat and low in calories. Plums are an excellent source of vitamin A, calcium, magnesium, iron, potassium, and fiber and contain a substantial amount of vitamin C. A prune is a dried plum.



**Grapes** are a berry. They are green or purple and grow in clusters on vines. The two types of grapes are tablegrapes, to be eaten raw, and winegrapes, used for the production of wine.



**Strawberries** are a good source of Vitamin C and Iron. They need to be eaten within one or two days of being picked. Like cherries, strawberries must be ripe when picked. They will not continue to ripen off the plant. Strawberries whiten the teeth.



**Melons** come in all sorts of varieties. Colorado is famous for cantaloupe and watermelon. Melons are large

juicy round fruit that grow on plants that trail along the ground. Watermelons contain as much iron as spinach along with many other vitamins and minerals. Melons are ripe when they spread a sweet smell.

? **Is a tomato a fruit?**

Tomatoes are soft juicy red or yellow fruit eaten raw or cooked.

A fruit is defined as the fleshy, seed-bearing part of a plant used as a food. A vegetable is defined as the part of various types of plants eaten as food. Some plants, therefore, can be called fruit-vegetables. Fruit-vegetables are healthy. They are good to eat. Some cookbooks make a distinction between fruit, fruit vegetables and vegetables. If you look at it that way, a tomato is a fruit-vegetable. That would be true of other plants: eggplant, green pepper, hot pepper, avocado, red pepper, cucumber and zucchini.

Raisins are dried grapes...  
Prunes are dried plums...



# In a Colorado orchard

Cliffs surround an area on the east side of the Grand Valley. This is Palisade, Colorado. The cliffs conserve heat and funnel air currents. As a result, the temperatures near Palisade are three to five degrees warmer than the rest of the Grand Valley. The airflow inhibits frost from harming tender fruit blossoms and promotes the growth of sweet, healthy, sun drenched peaches.

Peach production requires a great deal of intense “hands-on” care from the pruning, thinning, and watering to the harvesting and packing.

Direct links to the first settlers and to the early history of this beautiful valley exist with Talbott Farms and many of today’s growers. Orchard production includes not only peaches, apples, apricots, cherries and other fruits but a significantly growing number of wine grapes.

The photos on this page are being shared by Talbott Farms, Palisade, Colorado.



## Number the following statements so they are in sequence.

First things first!



\_\_\_\_\_ The ripened fruit is carefully hand picked from the trees and loaded into a wagon.

\_\_\_\_\_ The pink blossoms have turned white. Trees are getting ready to bear fruit.

\_\_\_\_\_ Peaches have matured and are ripening on the trees.

\_\_\_\_\_ It is spring and new pink blossoms adorn the trees in the orchard.

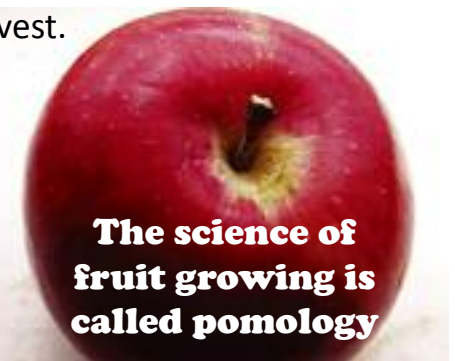
\_\_\_\_\_ An orchard owner wears many hats. This hat keeps the sun off his head in late summer as the orchard is now ready to share their harvest.



**Peaches and apples are members of the rose family.**

**Peaches continue to ripen after they have been**









**picked from the tree.**



Trees can be grown from either a peach or nectarine seed, but the fruit quality of the resulting tree will be very unpredictable.



A good harvest requires several elements:

-  a healthy plant that is getting the nutrients it needs;
-  adequate water;
-  bees to pollinate the blossoms; 
-  temperatures that are not too hot and not too cold;
-  protection from weather extremes and wind;
-  protection from pests;
-  protection from diseases.



## Mary, Mary quite contrary, How does your garden grow?

Some fruit grows on trees (apples, peaches, pears). Some fruit grows on bushes; others on shrubs (berries). Some fruit grows on climbing vines (grapes); others grow on trailing vines (melons).

Trailing vine plants, like watermelon and cantaloupe, are annuals. Seeds are planted each year. A new plant grows, blossoms then sets fruit which is ripened in one season. Trailing vine plants are similar in that respect to other row crops like corn or beans.



Climbing vines, like grapes, grow year after year. The plant overwinters then produces a new fruit crop the next year. Apple trees do not start bearing fruit until they are four or five years old. The trees need time to grow and mature, then they will bear fruit. Once the tree is mature enough to produce fruit it can do so year after year.

### PLAN AHEAD

It takes advanced planning to replace trees or add a different variety to a fruit orchard. Fruit growers will order trees from established tree nurseries. They order trees two to three years before planting them in their orchards.

Fruit tree nurseries, of which there are none in Colorado, are a source for new trees. It can take two to three years for a nursery to grow custom ordered trees.

### PROPAGATION

Tree nurseries use a variety of propagation methods. Shrub- and tree-grown fruit plants can be started from seed or from cuttings (a piece of the shrub or tree is cut and then rooted).

Growing trees from seed is the least preferred method because the quality of the resulting trees can be unpredictable.

Grafting is a propagation method that results in a reliable fruit crop in the shortest time. Both tree nurseries and orchard owners can use grafting. Grafting is a way for fruit growers to add different varieties of fruit to an existing orchard.

The words you need to know to talk

about grafting are rootstock, scion and cultivar.

### GRAFTING SIMPLIFIED

One of my fruit trees doesn't produce as much fruit as I'd like. I'll pick it to be a rootstock. It is a MacIntosh tree.

Late winter: the MacIntosh tree is pruned. When done, the tree has just one "nursery" limb and some branches, cut flat, that will host the new varieties.

The two varieties that will grow on the rootstock are Gala and Fuji. Scions of these varieties are harvested and embedded under the bark in the pruned branches. There is a trick to doing this



properly to get reliable results. It has to do with matching the cellular parts of each so they will grow together. There are steps to take to be sure the grafts stay in place.

The tree can be left alone and cared for as any other tree. The nursery limb will continue to help feed and nourish the rootstock. After some

time has passed, the grafts will grow into limbs. The nursery limb will be pruned off so no MacIntosh apples will grow. The new limbs will grow leaves and blossom. The year they bear fruit, my former MacIntosh tree will be providing Gala and Fuji apples. My new tree is a cultivar.

Use information from pages 4 and 5 and information contained here to answer:

How many small apples  
do you need to bake  
two 9-inch pies?



**Two pounds of  
apples make one  
9-inch pie**

A pound weighs 453.59237 grams