



# Orchard Installation

## Part 1

**Grade: 3-5th**

**Season: Spring**

### Objectives

- Understand the historic, socio-economic and ecological benefits of planting a heritage orchard
- Understand how to install irrigation and tree spacing for a full-size orchard
- Identify MORP and the role they play in the state of Colorado

### Materials and Tools

- Shovels
- Irrigation supplies
- Costume box
- History of Montezuma County Orchards skit
- Cowbell

### Before You Begin

- Call to have the area surveyed before digging. Know if there are any gas, electric or water lines under the orchard. Know if there are any sprinklers or lines that may be cut during digging.
- Carefully read and familiarize yourself with the orchard skit at the end of this document
- Connect with guest speakers from MORP to be at the Orchard Installation Part 2 lesson
- Mark the locations for each tree and irrigation lines with marking paint

### Opening Circle

1. Survey students' understanding by verbally sharing the questions or blue text in italics. Briefly gather input from the students, while steering the discussion toward the answers listed below the question.
2. *Has anyone seen old orchards in Montezuma County? How old do you think those trees are?*

3. Explain to the students that when they hear their character or object spoken about in the story. They will hold up their prop, or act out what their character does.
4. Read the skit, while encouraging students to actively participate along the way.
5. *Why would we want to graft old trees in Montezuma county, rather than ordering a tree from out of our state or region?*
6. *Why is it important for us to identify and graft these old orchards as soon as possible?*
- 7.
8. No, plants cannot live forever. This is because plants grow within a life cycle, just like all living things on Earth. There is a beginning and an end to the life cycle. At the cycle's end, the plant grows seeds to ensure the cycle will start all over again.
9. Show a visual example of the plant life cycle by dressing up an instructor with the
10. Explain to the students that when they hear their character or object spoken about in the story. They will hold up their prop, or act out what their character does.
11. Read the skit, while encouraging students to actively participate along the way.
12. Divide the students into four groups and walk to the orchard.

### **Procedure**

1. Students are divided into working groups. Each group will be with one adult, and the group will be responsible for digging a hole at least 24 inches deep and 24 inches wide.
2. Give students a demonstration on how to break the ground with a spade shovel.
3. If students finish digging their hole before time's up, they can begin to dig the marked line for the irrigation trench.

### **Closing Circle**

- Students return to circle up area.
- Ask a students to report back on one thing they learned about apple trees today.
- Thank students for their hard work to prepare the orchard. Invite them to return for the tree planting and to meet MORP, the heritage fruit tree champions of Montezuma County!

# The History of Fruit Trees in Montezuma County

*Narrator speaking: (Try to more or less memorize it and not just read it. Students with props become involved whenever their prop is mentioned. We have a cardboard tree, apples, sun, raindrop, ladybug clips, a string of leaves/flowers, a lady bug costume, bee costume (you can give different pieces to different kids so more kids can be involved), and you can make more!)*

The year was 1881...

A group of covered wagons made the long and arduous journey from **Missouri to Colorado**. In the wagons, there were people, and food, and clothes and things like that. But there were also fruit trees! There were 100 apple trees, plus some pear, apricot, peach, and cherry trees, too.

Once these fruit trees arrived in Western Colorado (just a little north of here) they were planted. But they were experiments. Up until then, the people here worked in mines, producing gold and silver. There were some farmers, but they grew dry land crops like beans. And there were ranchers who raised cattle. Growing fruit trees was a new adventure: no one knew if these trees would grow and produce at a high elevation, in a different climate. (Q: *Who knows what the elevation is here?*)

Well... with time, the trees did in fact grow! Their roots extended, their branches stretched up and out. The **sun** shone often and the trees converted this light to energy. It **rained** sometimes, but not regularly enough for these trees. To solve this dilemma, the farmers decided to set up irrigation systems that carried water from the rivers to the trees. With this consistent water, the trees grew **leaves**; their **flowers** blossomed and bees visited. **The bees flew from tree to tree**, transferring pollen as they went. After the blossoms were pollinated, they produced fruit!

When the farmers realized that certain fruit trees could thrive and produce in western Colorado, they wanted to grow more. So they grafted their trees. (Q: *Who knows what grafting is? Grafting creates a copy of a tree. It has the same DNA, or genetic code*). To graft, the farmer would take a **twig** from one tree, the tree they wanted to copy. The farmer would make sure this was a tree that they knew would grow and they wanted to make more of. They connected this twig to the **rootstock** of

different tree. Now this was a tricky process, and it didn't always work. Even with **sun, water** and nutrients from the soil- only some of these trees grew.

Some of these grafted (or copied) trees that were planted in Montezuma County grew. My-oh-my and were they tasty! Farmers in Montezuma County discovered that the high elevation with its warm days and colder nights made their fruit sweeter. Soon enough, there were lots of orchards throughout the county. (*Q: Who knows what an orchard is?*)

These orchards produced over 50 different types of apples, along with other types of fruit too. All of the different types of apples **looked and tasted different**. The many types of each fruit tree helped ensure that each year, there would be fruit. Things that might affect one type of tree wouldn't damage another. So for example, if an unexpected **frost** occurred, the trees would be affected differently. **Only some would be hurt**.

Now the year is 1904. We have SO many types of EACH fruit growing here. Farmers in Montezuma County took their fruit to the World Fair in St. Louis, and it wins the gold medal. The fruit that grew here is the most delicious fruit in the world.

By 1922 there were 48,630 apple trees in Montezuma County. (*Q: Who remembers how many apple trees came over on that wagon from Missouri at the beginning of the story?*) From 100 trees to 48,000 trees. Business was good, and farmers made lots of money for their unique tasting fruits.

As time went on, people wanted all of their apples to look the same. In the northwest, the state of Washington began producing lots and lots of apples that were bright, red, and uniform in size. **Because this is what people wanted, the growers in Southwest Colorado began planting the same type of apple tree here too**. But without diversity- or many different types of trees- the orchards became very vulnerable. One disease or frost could wipe out all of the trees instead of just a few.

Eventually it became clear: growers in Montezuma County couldn't produce as much fruit as the growers up in Washington. Even though our

fruit was more delicious, our growing season is shorter. In Washington, the climate allows farmers to grow more apples. Even though these apples didn't taste sweeter or more unique, everyone wanted them because they looked the same.

Growing apples in Montezuma County was no longer a profitable business. **Fruit growers stopped tending to the orchards in southwest Colorado,** and found new ways to make money. For years and years, the trees sat.

Fast forward to RIGHT NOW.

Across the country and the world, people are again starting to appreciate apples and other fruits with **unique tastes**. They are also seeing the importance of having many types of the same tree - or diversity. This diversity is especially important as our climate changes. Certain traits that we don't value in trees right now may be very valuable in the future.

But here's the problem. The fruit trees - those trees whose fruit won gold medals for having the most delicious in the whole world- are reaching the end of their lives. They're very old. **Luckily, there are people in our area who have taken an interest in restoring the orchards and saving the fruit trees.** These people have created the Montezuma Orchard Restoration Project to help bring our orchards back. This project uses grafting to make copies the old trees (Remember grafting involves connecting a twig from the tree you want to a set of roots taken from another tree) so that they can continue to grow. In reality, these new trees are hundreds of years old. That's really special.

What the Montezuma Orchard Restoration Project hopes to do, and what we hope to get all of you involved with, is planting new orchards, and bringing new life to historic orchards. (mention school orchards if you want)

*Q: Who wants to see more fruit trees in Montezuma County?!*

You all can help by doing 2 different things: trying lots of different types of fruits that are grown here: apples, peaches, cherries and apricots, AND taking care of the fruit trees.





## Orchard Installation

### Part 2

**Grade: 3-5th**

**Season: Spring**

#### Objectives

- Distinguish the differences between a tree grown from a seed or a graft
- Understand how to graft a tree
- Understand how deep to plant a tree and how to care for it

#### Materials and Tools

- Shovels
- 4 buckets
- Compost
- 100 feet of 48" tall welded utility fencing
- 36 2-foot sticks of rebar
- Driving hammer
- Hose or buckets of water
- 12 4x4 sheets of cardboard
- 8 pencils
- 4 pairs of scissors to cut cardboard
- Roll of string
- 12 heritage apple trees
- Wire cutters
- Measuring tape
- Cowbell

#### Before You Begin

- Confirm with MORP about the day's logistics
- Complete any unfinished holes and irrigation installations from Part 1
- Cut fencing into twelve 8'4" pieces
- Cut string into four 2.5' lengths
- Tie each end of string to a pencil, making the distance between the string the same as half of the width of your cardboard
- Set shovels, buckets with compost, cardboard, string, pencils, scissors, fencing, hammer and rebar next to the 4 trees each class will be planting

- ❑ Set up a

### Opening Circle

13. Survey students' understanding by verbally sharing the questions or blue text in italics. Briefly gather input from the students, while steering the discussion toward the answers listed below the question.
14. *Who remembers why it is important for us to revitalize the orchards in our community?*
15. *Who remembers the name of the organization that is leading the efforts to restore orchards in Montezuma county?*
16. Introduce the students to MORP.
17. Divide the students into two groups. Explain that half of the class will learn about grafting while the other group will be planting trees.
18. When students and teachers hear the cowbell, it is time to switch stations.

### Procedure

4. Students are divided into working groups. Each group will be with one adult, and the group will be responsible for planting one tree.
5. Give students a demonstration on how to break up the ground with their hands and mix compost into the hole to backfill.
6. Show students how to check the depth of their tree, by setting the pot in the hole. The graft line should level with the ground.
7. Demonstrate how to carefully remove the tree from the pot and have students pat mixed soil and compost around the tree.
8. Students will now water the tree with their bucket or hose
9. Demonstrate how to draw a perfect circle using two pencils and a string. Place one pencil directly in the center of the cardboard sheet. Stretch the other pencil as far as possible and move it around 360 degrees.
10. Have students cut out the cardboard circle and cut a slit to the center, with a small circle cut out for the trunk.
11. Place the cardboard collar around the tree.
12. Create a cylinder with the fence and fix it into the ground using the rebar and hammer
13. Ring cowbell and switch stations
14. MORP will conduct an interactive presentation on how to graft a tree

### Closing Circle

1. Students return to circle up area.
2. Ask a students to report back on:
3. *One thing they learned about grafting.*

4. *One thing they learned about planting.*
5. Explain to students that the orchard will need to be watered once a week during its first year, and it will take about 5 years for the trees to produce fruit.
6. Thank students for their hard work!