

Grade Level: 2

Essential Skills: 1,2,5,6

Time: 50 minutes, plus observation time over 10-day period.

NGSS: 2-PS1-4, 2-LS2-2

Materials:

- Apples
- Ziploc Bags (one per apple slice)
- paper
- pencil
- crayons or mark

What is in a Name?

The name of diseases often tells a lot about them. Below are actual fungus diseases common to apple trees and fruit in Oregon: Apple Crown Rot; Apple Powdery Mildew; Apple Scab; Black Rot & Blotch Rot; Blue Mold Rot; Bitter Rot; Cedar Apple Rust; Fire Blight; Fly Speck; Sooty Rot.

Additional AITC Resources:

Books:

Apples to Oregon

Oh Say Can You Seed?

Lessons:

Apple Faces

A is for Apple

Apple growers are like doctors. They need to be able to correctly identify the disease to properly treat it. Growers need a basic understanding of plant pathology and disease cycles.

Grow an Apple Fungus

Description:

Students grow mold on apple slices to simulate fungus diseases that attack apple trees. Students apply various “treatments” to apple slices, hypothesize which places and treatments are ideal for growing molds, and observe and name the molds like a plant pathologist.



Directions:

Part 1: Experiment Set-Up

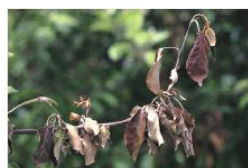
- 1) Separate students into groups. Give each group a few slices of apple and a Ziploc bag.
- 2) Have students give their apple slices the “treatment” you have labeled on their Ziploc bag. These treatments include: licking the apple slice; wiping unwashed hands on the apple slice; wiping it with washed hands; rubbing the slice on the floor or their shoe; coughing on the slices. Add other “treatments” you and your students can imagine.
- 3) After the apple slices have been treated, seal the bags tightly.
- 4) Have the other apple slices with no treatment sealed in bags. These will be the **control samples**.
- 5) Each group should choose a different place in the room (different temperatures, sunlight, etc.) to place their slices. Leave the apple slices in these spots for a week along with a control sample. Monitor daily for signs of molding or rotting.
- 6) Depending on grade level, the class can **hypothesize** about the different effects the various treatments will have on the molds. By observing the apple slices each day, younger grade students can talk about changes and draw pictures of what they observe. Upper grades can discuss, hypothesize, and create a graph to plot changes in the apple slices (i.e., rate mold grows, etc.).

Part 2: Identifying Diseases

- 1) Students imagine they are plant pathologists and a fungus is attacking local orchards. Have them make up names for the diseases. Diseases are often named for how they look. The sidebar contains some actual names of diseases. Ask students to draw realistic pictures of the mold on their apple slices and label them.
- 2) Have students write about how they could get rid of the fungus disease in an orchard. How could they prevent it from happening in the first place? Allow time for students to discuss their ideas (trim out under brush, improve air circulation, etc.)

Notes: DO NOT open the bags after the mold starts to grow. Throw the bags out after the lesson is completed unopened.

Fire Blight



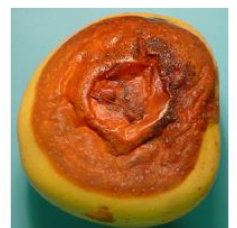
Powdery Mildew



Apple Scab



Bitter Rot



What Are Apples Made Of?

Apples are 84% water and are *climacteric*, meaning they produce an increased amount of carbon dioxide as they ripen. During ripening, apples can change color, soften, and become sweeter and less astringent.

Preserving Apples

During the long, cold winters, settlers could not grow fresh fruits and vegetables. So, they found ways to preserve them. Apples were an easy fruit for the settlers to preserve. The apples were peeled and cored and then hung out to dry on a big net or string. The warm air would evaporate the water inside the apples, and they would be dried in two or three days. Settlers also used apples to make apple juice, apple cider, dried apples, apple butter and vinegar. The apples were even food for their livestock - pigs, cows, and horses.

No Brown Apples Please

You can use fruit juice high in Vitamin C (citrus fruits - limes, lemons, oranges) as an anti-browning treatment when preserving apples. To treat apples, place slices in a bowl, add enough juice to cover the cut fruit, and soak for 10 minutes (no longer or they will absorb too much water.)



Activity Page

Grow an Apple Fungus

Directions: Record the growth of mold using drawings and descriptions. Make sure to label each observation with the treatment you are observing.

Observation Log Day: _____

Draw

Observation Log Day: _____

Draw

Observation Log Day: _____

Draw

Observation Log Day: _____

Draw

Observation Log Day: _____

Draw

Observation Log Day: _____

Draw