

— FARM *to* YOU —



— Table Grapes —



Agriculture surrounds us in California and it all starts with the sun. Today, 99 percent of U.S. table grapes are produced in California's warm, dry climate that is ideal for grape growing. The energy from the sun captured by the vines is converted and used for growth and production. California's table grapes are cultivated, picked, packed, and transported with the greatest care to ensure the berries you enjoy arrive in just-picked condition. There is much more to the story, but the sun is where it all begins on the journey from **Farm to You!**

From Farm to You: TABLE GRAPES

DORMANCY & PRUNING: In winter months, growth and development stop temporarily and the vine rests. This stage is called dormancy. During dormancy, growers prune and train the vine—deciding how much and which parts of the previous season's growth to remove in order to produce quality grapes and the best possible yield.

1



BUD BREAK & SHOOT DEVELOPMENT: Tiny buds on the vine start to swell and green leaves begin to appear. Powered by energy from the sun stored within the vine during dormancy, the first shoots start to grow. Growth is slow at first, but as temperatures rise, shoots can grow one inch or more per day.

2



FLOWERING & FRUIT SET: In spring, grapevine flowers begin to bloom in clusters. Flowers have both male (stamens) and female (carpels) parts. Immediately prior to blooming, the pollen sacs open and self-pollination occurs. The fertilized flower begins to develop a seed surrounded by the grape berry flesh. Most California table grape varieties are seedless—soon after fertilization the seed stops developing.

3



BERRY DEVELOPMENT: As berries develop, they become larger and change in color. All immature berries are green. Some varieties turn black or red, while green varieties become more translucent. Fruit flavor becomes sweeter and less acidic.

4



HARVESTING: Unlike many fresh fruits, grapes are harvested fully ripe. When grape berries achieve the correct size, sugar content, and color, clusters are packed by hand into shipping containers.

5



ARRIVING IN THE MARKET: Shortly after picking and packing, the field heat is removed from the fruit in cold storage facilities. California table grapes will be maintained in a carefully regulated environment to assure they arrive in just-picked condition at retail stores and food service operations in markets around the world.

6



YOU: Consumers can enjoy California table grapes from May through January. Whether consumed in a restaurant, at school, at home, or on the go, grapes are a healthy source of vitamins and nutrients.

7



Lesson Plan: Hanging High

Introduction: Grapevines are climbing plants that can grow far and fast in a single season. Tendrils attach to nearby structures to support the plant. Grape growers use man-made structures called trellises to support the vines. Trellises raise the shoots and fruit off the ground, allowing sunlight in evenly, and separate clusters.

Objective: Using the available materials, students will design and build a model of a trellis system that achieves the desired outcomes listed above.

California Standards: NGSS: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3

Materials (For Each Group): 50 wooden craft sticks, white glue, ruler, paper and pencil, computer with internet connectivity, binder clips (used to clamp together craft sticks while drying), 20 chenille stems (to represent the vine), 5 twist ties cut in half (to represent tendrils), 30 pony beads (to represent grape clusters).

Procedure:

- 1 Show students several different images of trellis systems used in table grape production.** Point out the common use of triangles, which increase stability in structural design. Explain desired outcomes and permitted materials. The overall goal of the project is to design a trellis system that raises the vines and fruit off the ground, allows sunlight in evenly, and separates clusters. The craft sticks may be cut to any length and arranged in any way to meet the desired outcomes.
- 2 Direct teams to research online, examining real-life trellis examples for ideas.** Have each team member brainstorm and sketch a possible trellis design, including estimated dimensions. Have teams discuss, compare, and select their preferred design.
- 3 Build a prototype.** Use the provided materials to build a trellis. Use binder clips to clamp together craft sticks as they dry. Once trellises are completed, have teams re-sketch, measure, and label their final prototype.
- 4 Test and evaluate the prototype.** Distribute the chenille stems, twist ties, and pony beads. Instruct students to use all the materials to model a grape vine and evaluate whether their trellis achieves the desired outcomes.
- 5 Challenge students to reflect on their experience.** Give groups the opportunity to determine structural weaknesses and identify areas for improvement.

Activity: Grape Berry Smoosh

Introduction: The structure of the grape berry may be divided into three main tissue types: skin, flesh, and seed. How will smooshing grapes affect structure and mass?

Objective: In this lesson, students will test the Law of Conservation of Mass after applying a physical change to berry structure.

California Standards: 5-PS-1-2

Materials (For Each Group): Balance scale, 20 grape berries, sealable plastic freezer bag.

Directions:

- 1 Provide each group with 20 grape berries in a sealable plastic bag.** Students should verify the bag is completely sealed, without any air inside. Instruct students to measure the total mass of the sample using a balance scale. Record the mass.
- 2 Time to smoosh!** Students can choose any method of smooshing their grapes. It is essential that their bags remain sealed, and no liquid leaks out.
- 3 After the grapes have been adequately smooshed, students should record the mass again.** Reflect on the physical changes that occurred. Identify which attributes changed (appearance, volume) and which stayed the same (mass). Explain the Law of Conservation of Mass and think of other real life examples that prove this scientific law.

For more information about table grapes, visit:
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