# Harvest of the Month

# Florida Strawberry



### **Meet Your Farmer**



Did you know Florida is considered the "Winter Strawberry Capitol of the World?" Florida strawberries are grown across the state as field crops and are more commonly grown in hydroponic towers. Take your students to visit a local U-Pick farm to get a first-hand experience harvesting this tiny treat.

#### For more resources visit these websites:

Florida Farm to School
FreshFromFlorida.com/FarmtoSchool

Find a Strawberry Farm Near You **FloridaStrawberry.org** 



#### Dear Teacher,

This fabulous fruit is packed full of vitamin C, shines bright red when it's ripe and is the only fruit whose seeds grow on the outside... You guessed it – the feature product for this month is the Florida strawberry! This nutritious gem adds flavor to any salad, smoothie or breakfast cereal. Strawberry plants are easy to grow and a great teaching tool, so pick

up a new classroom "pet" from a local nursery today. Susie Strawberry, our sensational scientist, will take your students on a tasty tour of this unique berry and guide them through Florida's strawberry industry. Let's get started!

### Classroom Recipe Strawberry Pops 12 Servings

#### INGREDIENTS:

- 12 strawberries
- 1 cup low-fat vanilla yogurt





- 1 cup lightly crushed whole-grain cereal
- 12 (4-inch) lollipop sticks

#### PREP:

- 1. Rinse strawberries and remove the leaves.
- 2. Dip the berries in yogurt, then in the cereal.
- 3. Insert sticks into the narrow end of the strawberry. Serve immediately.

This institution is an equal opportunity provider.



Florida Department of Agriculture and Consumer Services Adam H. Putnam, Commissioner

## Harvest of the Month

## Middle School

## **Class Chatter**

#### **Did You Know?**

- Plant City in Hillsborough County is the "Winter Strawberry Capital of the World."
- Strawberries are available from November until the beginning of April, with peak harvest season occurring in February and March.
- Florida is the second largest strawberry producing region in the United States with approximately 8,000 acres of land growing strawberries across the state.
- Strawberries are the only fruit that have seeds on the outside – about 200 of them. But commercial strawberry plants are not grown from seeds, they are propagated and identical copies of the parent variety are planted in the farm fields.
- The Florida Strawberry Festival in Plant City takes place each year in early spring. This annual fair features many exhibits, world class entertainment and, of course, Florida strawberries.

## **Tasty Tips**



- Strawberries do not ripen after they are harvested, so pick berries that are firm, plump and fragrant with a bright glossy red appearance. Avoid bruised or shriveled berries. Their fringed caps should be bright green and look fresh.
- Fresh strawberries should be refrigerated and eaten within three to four days of purchase. Remove the berries from the refrigerator an hour or two before serving.
- To help berries retain flavor, texture and nutrients, avoid washing or removing their caps until you are ready to use them.
- Fresh strawberries are highly perishable. Use them soon after purchasing for the best flavor, appearance and nutrient content.
- A dash of balsamic vinegar, lemon juice or orange juice will bring out the flavor of strawberries.



## **Balance Your Nutrients**

You can use the Nutrition Facts label to help limit the nutrients you want to cut back on, such as total fat, saturated fat, trans fat, cholesterol and sodium. In addition, the Nutrition Facts label can also be used to increase the nutrients that should be consumed in greater amounts, such as dietary fiber, vitamin A, vitamin C, calcium and iron.

Amount Per	Serving			
Calories 4	6	С	alories f	rom Fat (
			%	Daily Value
Total Fat 0	g			0%
Saturated Fat 0g				0%
Trans F	at 0g			
Cholesterol Omg				0%
Sodium 1r	ng			0%
Total Carb	ohydra	ate 1	1g	1%
Dietary	Fiber 3	3g		4%
Sugars	7g			
Protein 1g				
Vitamin A	0%	•	Vitami	n C 113%
Calcium	2%	•		Iron 3%

## Good for Your Body

Strawberries are one of nature's best sources of vitamin C, which is known to help promote immunity and wound healing. Strawberries are also an important source of phytonutrients, including anthocyanins and ellagic acid. Phytonutrients are plant chemicals that contain protective compounds, which are being researched for their potential health benefits.

These compounds may play a role in the prevention of some chronic diseases, including cancer, heart disease and diabetes.

AMIN C

## A 'Berry' Interesting Fruit!

Strawberries have been around for centuries and were first mentioned in ancient Roman literature for their medicinal properties. Wild strawberries were cultivated during the 16th and 17th centuries, but it wasn't until the 18th century that the first documented garden strawberry plant was grown in France.

Strawberries are a member of the *Rosaceae* (rose) plant family and one of the most popular fruits cultivated worldwide. Strawberries are



not considered to be an actual berry because the seeds grow on the outside of the fruit. In fact, strawberries are the only fruit that have their seeds on the outside of their skin. However, these seeds are called "achenes" and are typically only cultured to grow new strawberry varieties in plant laboratories. Strawberries have a unique life cycle quite different from other fruits and vegetables. Check out StrawberryPlants.org to learn about how this species propagates to grow exact clones or "daughter" plants that are genetically identical to the parent "mother" plant.



Label the parts of the strawberry plant from the word bank.

 Vrg ggo
 Stem
 Runner
 Daughter

 Leaf
 Flower
 Fruit

 Roots
 Crown

## **Florida Strawberry Production**

The United States is the world's top producer of strawberries, with most of the fruit grown in California and Florida. Other states that also commercially grow this fabulous fruit are Michigan, North Carolina, New York, Ohio, Oregon, Pennsylvania, Washington and Wisconsin. California produces over 90% of the entire strawberry crop, while Florida leads the winter production. Plant City in Hillsborough County, Florida is recognized as the "Winter Strawberry Capital of the World," and is home to some of the sweetest, reddest and juiciest strawberries around.

The following graphic from the 2014 publication <u>Florida Agriculture by the Numbers</u> shows the value of Florida's strawberry production. Answer the following questions to learn more about one of Florida's most valuable winter crops.



- 1. What year produced the highest and lowest number of flats? How many more million flats of strawberries were produced in the best year compared to the worst year?
- 2. Rank the production years of Florida strawberries from greatest to least.
- 3. What are the top five strawberry producing years? Estimate the total number of flats (in millions) produced in these five years. Create a pie chart to represent this data.
- 4. Calculate the average number of flats produced from 2001 to 2005. Compare this to the average number of flats produced from 2010 to 2014. From this data, what conclusions can you make about the strawberry industry?
- 5. One flat contains 12 pounds (lb) of strawberries. Convert this to kilograms (kg).

## The "Straw-Berry"

Ever wondered where strawberries got their name from? (*Hint: Think of the two base words that combine to create this compound word – straw and berry*).

Check out this video for more hints! Growing Strawberries (BonniePlants.com/growing/growing-strawberries)



## Science, Technology, Engineering and Math Connection

#### Field vs. Hydroponic Strawberries

Strawberry fields are planted in several counties around Florida, but strawberries are also gaining popularity as a productive hydroponic crop. Working in teams, have your students research the different cropping methods of growing Florida strawberries. Ask them to imagine they are a new farmer just breaking into the strawberry industry. Their task is to choose whether to start a field crop production or invest in a hydroponic operation. Have them create a presentation to show their classmates the benefits of their chosen business plan.

Encourage your students to utilize the following University of Florida IFAS Extension resources to learn how to grow strawberries in Florida:

- Growing Strawberries in the Florida Home Garden
- Strawberry Production Around the World
- Outdoor Hydroponic Specialty Crop
- Hydroponic Vegetable Production in Florida



Hydroponic Strawberries



Strawberry Field

#### **Strawberries Like Their Hats!**

Did you know that strawberries are harvested with their 'caps' still attached?

A portion of the stem is left on the berry to help them stay fresh. Strawberries do not continue to ripen once they have been harvested off the plant. Once harvested, berries are put directly into plastic containers called clamshells and shipped to stores all across the country.



## **Frozen Strawberries?**

Because of California's mild climate of coastal and southern portions of the state, strawberries have a 12-month growing season, while the growing season is Florida is shorter. Florida's strawberry season runs

from mid-November until March, with peak harvest in February and March. Planting starts in the central part of the state around mid-October, and the first harvest typically occurs around Thanksgiving.

Florida's winter climate is very similar to California's summer climate with an average minimum temperature in the 50's. Strawberry plants continue to produce after the first harvest and can be picked up to 60 times in any season, given proper weather conditions. Strawberries are only grown in a few

places across the state of Florida including: Citrus, Lee, Polk, Hillsborough, Manatee and Miami-Dade counties. The most productive strawberry growing region in Florida is Plant City, located in Hillsborough County.





Below is a table of the monthly average temperatures observed in Plant City over the course of the year.

Plant City	Jan	Feb	Mar	Apr	Мау	June	July	Aug	Sept	Oct	Nov	Dec
Maximum Temperature (°F)	72.1	74.7	78.2	82.7	88.1	90.4	91.0	90.8	89.3	84.8	78.8	73.7
Mean Temperature (°F)	60.5	63.2	66.7	70.9	76.8	80.7	81.7	81.8	80.3	75.0	68.2	62.7
Minimum Temperatue (°F)	48.9	51.7	55.1	59.1	65.4	71.7	72.5	72.8	71.4	65.1	57.5	51.6

Growers have to pay careful attention to the minimum daily temperatures during the winter strawberry growing season. The delicate flowers during the budding stage are susceptible to

frost damage, as are the young developing fruits. Even though Florida is known for its mild winters, cold air and freezing temperatures can still impact portions of the state.

Date	Minimum Temperature (°F)
January 2, 1905	15
January 1, 1981	17
December 2, 1995	18
December 1, 1962	18
January 1, 1927	18

For the most part, strawberry plants can tolerate temperatures down to 10°F while the buds are dormant. Once the buds become active and the flowers open, the plant's tolerance to temperature changes drastically so that the strawberries can only withstand drops in temperature down to 30°F.

The biggest temperature related threat to strawberries comes at night when two types of freeze events can destroy a crop. Radiation freezes occur on calm, clear nights (typically after the passage of a cold front) when the ground radiates the heat it absorbed during the day back into the sky, creating a layer of cool dense air



near the ground. Advection freezes are caused by cold air moving from one region to another and are often accompanied by strong winds and clouds.

Sprinklers are often used to protect strawberries when freezing temperatures are forecasted. The fruits and plants are protected by sprayed water. Water is continually applied to the fields and as the water freezes it releases heat. The frozen water on the outside of the fruit protects them from freezing on the inside, which would damage the fruit and plant.

#### The WeatherSTEM Connection...

Temperature data provides information on how hot or cold the air is at a particular place and time. Specifically, temperature is the measure of kinetic energy of the air molecules. There is a direct relationship between the movement of air molecules and temperature. If the molecules are moving quickly, the temperature will increase; and if they are moving slowly, the temperature will decrease. Scientists use an instrument called a



thermometer to measure temperature in units of Fahrenheit (°F) or Celsius (°C). Using what you've just learned how temperatures affect lettuce, let's explore the possibility of growing lettuce in your school's garden.

Using the WeatherSTEM station in your county, let's explore some different weather variables. To find the closest WeatherSTEM station to you, use the link below, but replace "your-county-name" with the name of the county where your school is located:

#### https://your-county-name.weatherstem.com

(For example, if your school is located in Leon County, visit https://leon.weatherstem.com)

Select an available WeatherSTEM station in your county and write down the current values for:

CURRENT TEMPERATURE	۴
LOW TEMPERATURE FOR THE DAY	۴
HIGH TEMPERATURE FOR THE DAY	۴
RAINFALL (LAST 24 HOURS)	°F

#### Activity #1

Using the data mining tool on the website, let's go back and look at the daily average temperature at the WeatherSTEM station over the time period of November 1, 2015 to February 29, 2016.

To do this:

- 1. Click on and select Thermometer.
- 2. Scroll down to the bottom of the page, select the time period from the calendar.
- 3. Make sure that "chart" is selected as the output format.
- 4. Set the interval to "daily" and operation to "average."

#### Activity #1 (continued)

The graph displays the average temperature for each day during our selected time period.

#### Answer the following questions:

- 1. What are some of the things you first notice about the data on the graph?
- 2. Why do you think this is the case?
- 3. How did you come to these conclusions?
- 4. Do you see any days that stand out as the lowest and highest values?

Write those dates and average temperature values down on a sheet of paper.

Use the data tool, select one of the dates you just wrote down and look at the data using the interval set to "minute." Click on the graph and a pop-up should appear with a picture from the WeatherSTEM cloud camera, and radar and satellite images.

What can you say about the weather on the day you selected?

#### Activity #2

Now let's compare data from a station near Florida's Strawberry Growing Region. Using the "Add Comparison Station" option, select "Hillsborough County, Florida" and the "Florida Learning Garden." Follow thte previous instructions and the graph will show the temperature data from the two different WeatherSTEM stations. Find a partner to discuss the graphs based on what you learned in the previous activity and answer the following questions:

- 1. Why would the values be different in the two locations?
- 2. How can the location and local weather impact the observed weather conditions?

### Additional Resources Explore these other WeatherSTEM lessons





weatherstem.com/resources