

# RESOURCES

TOOLKIT FOR TEACHERS GRADES 3 - 6

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# GET TO KNOW SUGAR BEET & CANE

## WHERE DOES SUGAR COME FROM?

Growing sugar beet and sugar cane plants is a family business, with sugar being grown and/or refined in 17 states. To ensure consistency and quality, the sugar from the plants is processed and refined before it gets to your home.



The first sugar beets in the U.S. were planted near Philadelphia in

**1836**<sup>1</sup>

Sugar beets contain ~16% sucrose

They weigh

**3-5 LBS.**  
WHEN HARVESTED

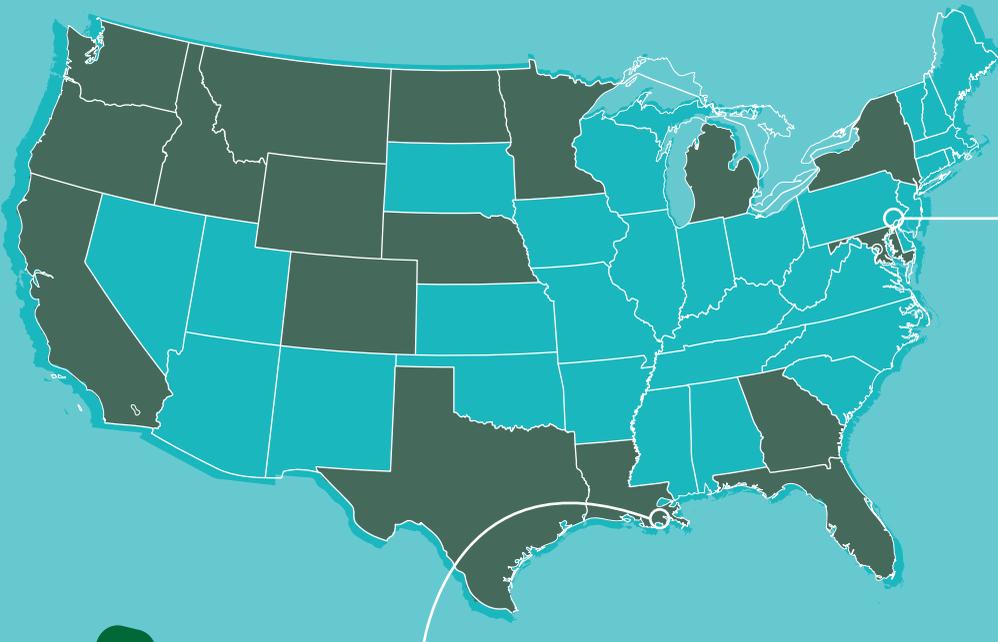
Sugar beet pulp is generally used for animal feed after the sugar is extracted<sup>4</sup> 

Sugar beet molasses can be used to remove or prevent icing of roads during the winter<sup>4</sup>

The growing season lasts for roughly five months

The first successful U.S. sugar beet factory was established in Alvarado, CA, in

**1870**<sup>1</sup>



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Sugar cane was introduced to the U.S. in

**1751**

in Louisiana<sup>2</sup>

Sugar cane contains ~14% sucrose

It grows

**10-20 FT.**  
**HIGH**

After the sugar is removed, the stalks can be turned into paper, cardboard and cutlery<sup>3</sup>



Sugar cane stalks can be burned to provide heat and electricity<sup>3</sup>

Sugar cane doesn't have to be replanted every year—stalks cut from existing crops are used to plant new ones<sup>5</sup>

The average stalk is  
**85% LIQUID**  
and weighs approximately 3 lbs.<sup>5</sup>

the  
**Sugar**  
association  
There's more to sugar.



@MoreToSugar

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# TYPES OF SUGARS

All sugar is made by first extracting sugar juice from sugar beet or sugar cane plants, and from there many types of sugar can be produced. Through slight adjustments in the process of cleaning, crystallizing and drying the sugar and varying the level of molasses, different sugar varieties are possible. Sugars of varying crystal sizes produce unique functional characteristics that make the sugar suitable for different foods and beverages. Sugar color is primarily determined by the amount of molasses remaining on or added to the crystals, giving pleasurable flavors and altering moisture. Heating sugar also changes the color and flavor (yum, caramell!). Some types of sugar are used only by the food industry and are not available in the supermarket.

See below for a few facts about some of the various types of sugar.

## WHITE SUGARS (contain little or no molasses)

### Granulated sugar (Table sugar)

- + "Regular" or granulated sugar is what you typically find in your sugar bowl
- + Granulated sugar is the most common sugar called for in recipes when cooking and baking
- + "Regular" sugar granules are fine because small crystals are ideal for bulk handling and not susceptible to caking

### Powdered sugar

- + Powdered or confectioners sugar is simply granulated sugar ground to a smooth powder, mixed with a small amount of cornstarch to prevent caking and then sifted
- + Powdered sugar is often used in icings, confections and whipping cream
- + You can make it at home: blend 1 cup white sugar and 1 tablespoon cornstarch to get 1 cup of powdered sugar

### Sanding sugar

- + Used mainly in baking and confectionery as a sprinkle on top of baked goods, sanding sugar can have large or fine crystals
- + This sugar reflects light and gives the products a sparkling appearance



## BROWN SUGARS (contain varying levels of molasses)

### Light and Dark Brown sugar

- + Brown sugars are made by mixing white sugar with various amounts of molasses
- + Light brown sugar is often used in sauces and most baked goods
- + Dark brown sugar has a deeper color and stronger flavor than light brown sugar. The rich, full flavor makes it ideal for gingerbread, baked beans, barbecuing and other full-flavored foods
- + Brown sugars tend to clump because they contain more moisture than white sugars, allowing baked goods to retain moisture well and stay chewy

### Turbinado sugar

- + Turbinado sugar, sometimes known as Demerara sugar or Raw cane sugar, is a partially processed sugar which retains more of the naturally present molasses
- + It has a blond color, mild brown sugar flavor and larger crystals than brown sugars used in baking
- + Turbinado sugar is the sugar in your packet of "raw cane sugar." This type of sugar has been processed just enough to make it safe to eat

### Muscovado sugar

- + Muscovado sugar, also known as Barbados sugar, is an unrefined cane sugar in which the molasses has not been removed
- + This sugar is very dark brown in color and has a particularly strong molasses flavor
- + Muscovado sugar crystals are slightly coarser and stickier than regular brown sugar, giving it a sandy texture

# WHERE IN THE U.S. does sugar come from?

## 6 Quick Facts

1

Sugar is grown and/or refined in **17 states** across the U.S.

2

Sugar beets grow best in places where the **temperatures are generally cooler.**

3

At sugar beet factories and sugar cane refineries across the country, the sugar from the plants is **purified into the sugar** shipped to grocery stores and food manufacturers.

5

Sugar beet factories are located near the farms to **shorten the distance farmers need to travel** with their beets.

6

Some raw **cane sugar** is also imported to the U.S. for refining.

4

Sugar cane is grown in **warmer, tropical climates.**



 sugar beet factory  
 sugar beet growth

 sugar cane refinery  
 sugar cane growth

# SUGAR BEET PROCESSING



# SUGAR CANE REFINING



# SUGAR'S FUNCTIONAL ROLES IN FOOD BEYOND SWEETNESS

		FLAVOR ENHANCER/ BALANCER, AROMA	BULK	TEXTURE/ MOUTHFEEL	SHELF-LIFE/ MICROBIAL STABILITY	FERMENTATION	FREEZING POINT DEPRESSION	COLOR	MOISTURE RETENTION
Dairy Products		●	●	●		●			
Whole-Grain, Fiber-Rich Breads & Cereals		●	●	●	●	●		●	●
Breads		●	●	●	●	●		●	●
Bakery Products		●	●	●	●			●	●
Salad Dressings, Rubs and Sauces		●	●	●	●				
Preserves & Pickling		●	●	●	●				
Jams & Jellies		●	●	●	●			●	
Canned Fruits & Vegetables		●	●	●	●			●	
Prepared Foods		●	●	●	●			●	●
Beverages		●	●	●	●				
Frozen Beverages		●	●	●			●		
Fermented Beverages		●	●	●		●			
Ice Cream		●	●	●			●		
Confectionery		●	●	●	●			●	●

WHAT IS

# MOLASSES?

## MOLASSES IS A CO-PRODUCT OF SUGAR REFINING AND PROCESSING.

Molasses, the thick, dark brown syrup you might buy at the grocery store, is found naturally in sugar beet and sugar cane plants. During the refining process, it is separated from the sugar crystals by spinning the sugar in a centrifuge.



Molasses is not as sweet as sugar but is used in many recipes for its rich flavor and moisture. Sugar beet molasses and sugar cane molasses have different flavors and consistencies and are not used interchangeably. Sugar cane molasses is primarily used for sweetening and flavoring foods while sugar beet molasses is not very sweet and is primarily used for animal feed and other commercial and industrial uses.

Sugar is a minimally processed ingredient. It is simply removed from the plant, washed, crystallized, spun and dried. The spinning step is where the molasses is separated from the sugar crystals.



Molasses comes in a variety of levels of sweetness, from the sweet and moderate flavor of confectionery/all-purpose molasses to the strong-flavored blackstrap molasses.

1 Tbsp of molasses has 58 calories



Molasses from sugar cane has been used since as early as 500 B.C.E. in India

Up until the 1880s, molasses was the most popular sweetener in the US



Sugar cane molasses is what makes brown sugar brown

Each stalk of sugar cane produces 6 teaspoons of molasses



Each sugar beet is made up of about 3.7% molasses

Molasses adds a broad range of flavors to foods from caramel to licorice



## Food Uses of Molasses

- Key ingredient in the distillation of rum
- Dark rye breads or other whole grain breads
- Cookies and pies
- Gingerbread
- Barbecue sauces
- Beer styles such as stouts and porters
- Home-made vinaigrette
- Jerky Processing
- Yeast production



## Industrial Uses of Molasses

- Ingredient in animal feed
- Fermentation source in the production of ethanol and other chemicals
- Industrial production of vinegar and citric acid
- Mixed with salt to de-ice roads
- Added to soil to promote microbial activity
- Minor component of mortar for brickwork



Real sugar comes from sugar beets and sugar cane plants.



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Learn more at [sugar.org](http://sugar.org)  
Contact us at [sugar@sugar.org](mailto:sugar@sugar.org)

the Sugar  
association

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