



Post-Trip Lesson Plan Sugar Cane

- I. Grade level: grades 6-8
- II. Objectives:
 - a. To understand the process of creating Sugar Cane.
 - b. To learn how to farm and tend the Sugar Cane Crop.
 - c. To discover the consequences of the industrial revolution on the sugar can industry.
- III. Standards:
 - a. Sunshine State Standards(2006):
 - 1) Social Studies: Time, Continuity, and Change: Standard 1: Knows the relative value of primary and secondary sources and uses this information to draw conclusions from historical sources such as data in charts, tables, graphs.
 - 2) Social Studies: Time, Conintuity, and Change: Standard 4: Knows the role of physical and cultural geography in shaping events in the united States (e.g. environmental and climatic influences).
 - 3) Social Studies; Time, Continuity, and Change: Standard 6: Understands the history of Florida and its people.
- IV. Vocabulary:
 - a. Cane Grinding: This is a party (sometimes called a syrup making party), where people gather to make syrup. This provided a much needed social event with music and fun, lots of good food to eat, and a source of extra help to make the work go faster.
 - b. Lever: Used to turn the gears which stir the Sugar Cane Syrup. This is found on steam powered Sugar Cane Mills.
 - c. Sweep: A sweep is a long pole that is hooked up to a mule. The mule then turns the gears on the Sugar Cane Mill, similar to a lever.
 - d. Gears: Aids in spinning and stirring the Sugar Cane Syrup.
 - e. Kettle: Where the Sugar Cane Juice is stored and cooked.
 - f. Base: provides support for the Sugar Cane Mill.
 - g. Commercial Sugar Cane Mill: a Sugar Cane Mill that has been created by a factory, marketed, and sold by a store or catalogue.
 - h. Ratooning: the re-growing of the sugar cane roots into a cane.
 - i. Node: a tough, fibrous tissue with a root band, growth ring, bud, and leaf scar.
 - j. Root Band; a small section of the node just above the leaf scar, and has many small dots. A root can develop at each dot.
 - k. Bud: located on the node, the bud is arranged in two rows, with the proper moisture a shoot of sugar cane can develop.
 - l. Internode: a section of the stalk between the nodes. It contains numerous fibers that strengthen the stalk. And the inside stores sweet juice.



Activity 1: Worksheet Sugar Cane

- V. Materials:
- Worksheet: Sugar Cane
 - Writing Utensil
 - Crayons, colored pencils
- VI. Procedures: Read the history of sugar cane (below) out loud to the class. Then hand out worksheet: Sugar Cane to the class, and allow time for the students to complete the worksheet.
- VII. History:
- Sugar cane is produced in tropical climates. It is planted in the spring and harvested between mid-late November in Florida. Those living in Florida in 1898 grew their own sugar cane for the purpose of being able to cook and bake sweets. Sweets at this time were not as plentiful as they are today. Furthermore, if the family wanted to have sweets they would either have to make their own sugar and syrup from sugar cane or they could purchase these supplies from a local general store.
 - When sugar cane is harvested it is cut near its roots but the roots are left intact. These roots are able to re-grow (called ratooning) each year for up to 3-4 years.
- VIII. Assessment: This activity can be graded based on accuracy and completion.
- IX. Open-Ended Questions:
- Where is sugar cane produced?
 - In what types of climates is sugar cane produced?
 - What type of climate does Florida have?
 - Where does sugar come from today?
 - How did those living in Florida in 1898 get sugar?

Activity 2: Sugar Cane Crop

- X. Materials:
- One copy of the Worksheet: Sugar Cane Crop
 - Construction paper
 - Markers
 - scissors
- XI. Procedures: Pass around to the class the Worksheet: Sugar Cane Crop while explaining information about the crop (below). Then allow the class to create their own sugar cane field.
- XII. Information:
- Sugar Cane is a crop that grows in warm, tropical climates. The plant should be planted in early spring so that the soil is moist.
 - The farmer needs to remove the leaves from the plant that block the sunlight from the ground (which blocks the ripening process of the plant).
 - The longer the Sugar Cane remains in the ground the higher the sweeter the syrup.
 - Harvesting begins in mid-late November in Florida. The top of the plant is first removed leaving the cane and the root. Cut the cane as long as possible without



destroying the roots. If done properly the roots will continue to grow as a crop next year (this is called rationing).

XIII. Sugar Cane Field:

- a. Pretending that it is spring allow your students to “plant” their own crop: each student can cut a piece of construction paper in half and roll each half into a cylinder and glue (tape) together. Then attach the two cylinders together by gluing one cylinder inside the other. Now that you have a large cylinder cut 2in. slits in the bottom of the cylinder and fold the slits outward (these are the roots of the plant). This should allow the cylinders to stand (weights cans also be used). Now take another piece of construction paper cut out leaf patterns and attach them to the top of the large cylinder. Once this is completed all of the students can line their sugar cane crops up and create a sugar cane field.
- b. Harvesting: Now pretend that it is mid-late November and it is time to harvest the crop. Give the students scissors and allow them to cut their leaves off the plant. And then cut the large cylinder near the base right before slits (roots). Once finished explain that the cane of the crop is the only part used to create the sugar cane syrup and that the roots are reused to create a crop of the next year.

XIV. Assessment: This is a group activity and can be graded based on participation.

XV. Open-Ended Questions:

- a. In what types of food do you find sugar?
- b. How often do you eat sugar?
- c. Are you surprised to learn how sugar is produced?
- d. How long does it take to grow sugar cane?
- e. Would you want to be a sugar cane farmer? Why?

Activity 3: Worksheet Sugar Cane Industry

XVI. Materials:

- a. Worksheet Sugar Cane Industry
- b. Writing utensil

XVII. Procedures: Hand out the worksheet: Sugar Cane Industry to the class and give them ample time to complete the worksheet.

XVIII. Assessment: This worksheet can be graded based on accuracy and creativity.

XIX. Open-Ended Questions:

- a. Do you think there is a sugar industry today?
- b. Where would sugar be exported to? (climates that are not able to grow this crop)



Name: _____ Date: _____

Post-Trip Lesson Plan Sugar Cane

Instructions: Review the vocabulary provided.

Vocabulary:

- a. Cane Grinding: This is a party (sometimes called a syrup making party), where people gather to make syrup. This provided a much needed social event with music and fun, lots of good food to eat, and a source of extra help to make the work go faster.
- b. Lever: Used to turn the gears which stir the Sugar Cane Syrup.
- c. Gears: Aids in spinning and stirring the Sugar Cane Syrup.
- d. Kettle: Where the Sugar Cane Juice is stored and cooked.
- e. Base: provides support for the Sugar Cane Mill.
- f. Commercial Sugar Cane Mill: a Sugar Cane Mill that has been created by a factory, marketed, and sold by a store or catalogue.
- g. Ratooning: the re-growing of the sugar cane roots into a cane.
- h. Node: a tough, fibrous tissue with a root band, growth ring, bud, and leaf scar.
- i. Root Band: a small section of the node just above the leaf scar, and has many small dots. A root can develop at each dot.
- j. Bud: located on the node, the bud is arranged in two rows, with the proper moisture a shoot of sugar cane can develop.
- k. Internode: a section of the stalk between the nodes. It contains numerous fibers that strengthen the stalk. And the inside stores sweet juice.

Instructions: Fill in the blanks with vocabulary words. Then write the letters with the corresponding numbers in on corresponding lines.

- 1) _____ is located between the Nodes.
1 2
- 2) This is when people gather to make syrup: _____.
3 4 5 6 7
- 3) _____ is a part of the Sugar Cane Mill that supports the structure.
8
- 4) _____ occurs when the sugar cane roots re-grow and create a crop for the next year.
9 10
- 5) The _____ is where the sugar can juice is stored and cooked.
11
- 6) Located on the node, the _____ is arranged in two rows.
1



Reliving Rural Florida's Past

Name: _____ Date: _____

7) The _____ is used to turn the gears.

14

Code:

12 13
 6-8 h
 1 2 2 4 11 6 8 10 13 9 8 2 10 12 10 1 14 2 h 6
 8 13 7 4 9 3 4 5 6 J 13 1 3 6 2 10 m 4 11 6
 h y p
 2 6 8 9 13

Instructions: Color the figure below on the Right by using the diagram on the Left.

	<p style="margin-top: 10px;">Color the Sugar Cane plant above:</p> <ul style="list-style-type: none"> Node: Red Vascular Bundles: Green Growth Ring: Blue Leaf Scar: Black Root Band: Yellow Wax Ring: Purple Corky Cracks: Orange Internode: Pink Area surrounding the roots: Brown
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Reliving Rural Florida's Past

Name: _____ Date: _____

Instructions: Use the chart below to answer the following questions.

AREA IN SUGAR CANE, INCREASE SINCE 1879, TOTAL PRODUCT OF SUGAR AND OF MOLASSES, AND AVERAGE YIELD PER ACRE OF EACH IN THE SIX MINOR STATES: 1889.

STATES.	Total area in sugar cane. (Acres.)	Increase since 1879. (Acres.)	SUGAR.		MOLASSES.	
			Total production. (Pounds.)	Average yield per acre. (Pounds.)	Total production. (Gallons.)	Average yield per acre. (Gallons.)
Alabama	10,415	12,788	890,835	20	2,333,231	120
Florida	9,345	1,407	1,092,015	181	1,441,744	154
Georgia	20,238	5,185	1,307,625	65	3,223,194	159
Mississippi	12,694	8,139	67,800	5	1,524,024	120
South Carolina	3,305	1,518	219,880	67	386,615	117
Texas	10,284	6,060	5,482,080	337	2,150,332	133

1. Name the three states mentioned in the chart above:

2. How many acres of sugar cane were grown in Florida in 1880?

3. Was there more sugar or molasses produced in Florida?

4. Why is this chart interesting to look at when studying sugar cane? (hint: what is the purpose of this chart)



Post-Trip Lesson Plan
Sugar Cane
Answers

Instructions: Review the vocabulary provided. Then color the figure below by using the diagram on the Left.

Vocabulary:

- a. Cane Grinding: This is a party (sometimes called a syrup making party), where people gather to make syrup. This provided a much needed social event with music and fun, lots of good food to eat, and a source of extra help to make the work go faster.
- b. Lever: Used to turn the gears which stir the Sugar Cane Syrup.
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- k. Internode: a section of the stalk between the nodes. It contains numerous fibers that strengthen the stalk. And the inside stores sweet juice.

Instructions: Fill in the blanks with vocabulary words. Then write the letters with the corresponding numbers in on corresponding lines.

- 1) The I N T E R N O D E is located between the Nodes.
 1 2
- 2) This is when people gather to make syrup: C A N E G R I N D I N G .
 3 4 5 6 7
- 3) B A S E is a part of the Sugar Cane Mill that supports the structure.
 8
- 4) R A T O O N I N G occurs when the sugar cane roots re-grow and create a crop for the
 9 10
next year.



Reliving Rural Florida's Past

5) The K E T T L E is where the sugar cane juice is stored and cooked.

11

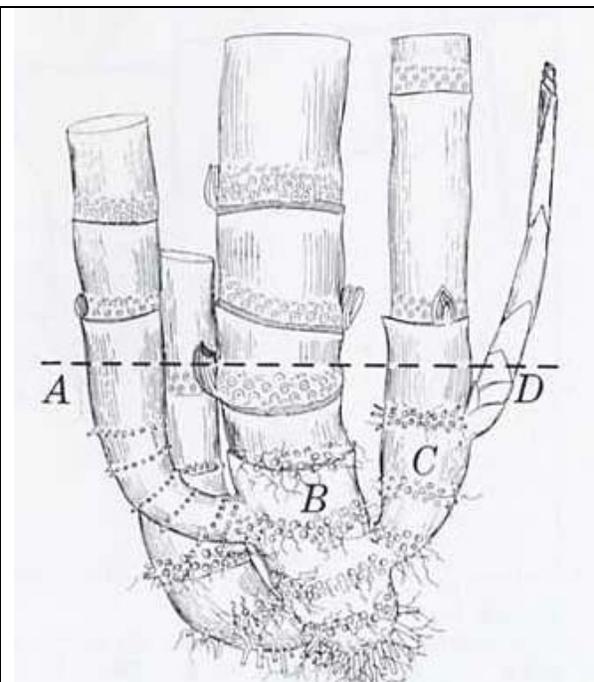
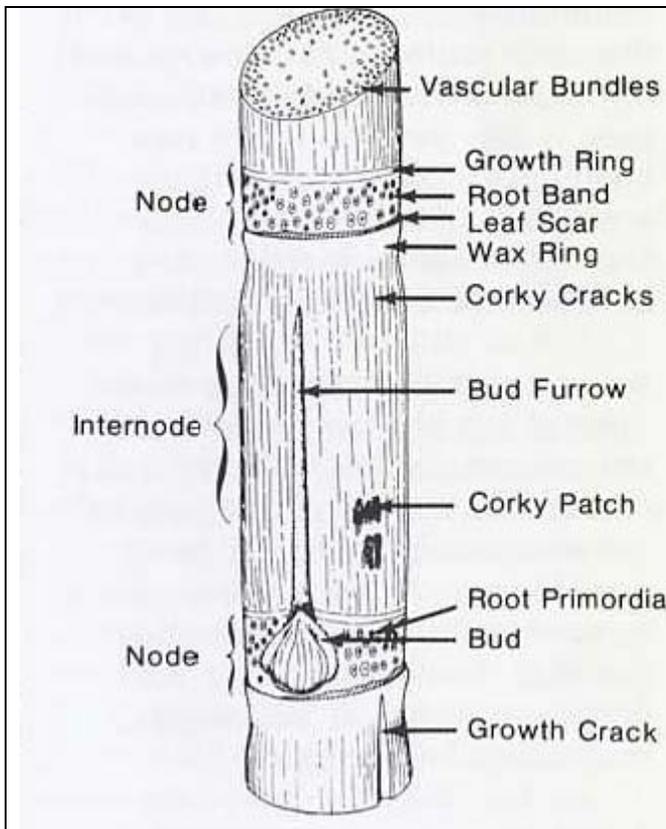
6) Located on the node, the B U D is arranged in two rows.

12 13

7) The L E V E R is used to turn the gears.

14

<u>I</u>	<u>T</u>	<u>T</u>	<u>A</u>	<u>K</u>	<u>E</u>	<u>S</u>	<u>6</u>	<u>8</u>	<u>H</u>	<u>O</u>	<u>U</u>	<u>R</u>	<u>S</u>	<u>T</u>	<u>O</u>	<u>B</u>	<u>O</u>	<u>I</u>	<u>L</u>	
1	2	2	4	11	6	8				10	13	9	8	2	10	12	10	1	14	
<u>T</u>	<u>H</u>	<u>E</u>			<u>S</u>	<u>U</u>	<u>G</u>	<u>A</u>	<u>R</u>	<u>C</u>	<u>A</u>	<u>N</u>	<u>E</u>	<u>J</u>	<u>U</u>	<u>I</u>	<u>C</u>	<u>E</u>	<u>T</u>	<u>O</u>
2	6				8	13	7	4	9	3	4	5	6	13	1	3	6		2	1
<u>M</u>	<u>A</u>	<u>K</u>	<u>E</u>	<u>T</u>	<u>H</u>	<u>E</u>	<u>S</u>	<u>Y</u>	<u>R</u>	<u>U</u>	<u>P</u>									
	4	11	6	2	6	8	9	13												



Color the Sugar Cane plant above:

- Node: Red
- Vascular Bundles: Green
- Growth Ring: Blue
- Leaf Scar: Black
- Root Band: Yellow
- Wax Ring: Purple
- Corky Cracks: Orange
- Internode: Pink
- Area surrounding the roots: Brown



Instructions: Use the chart below to answer the following questions.

Table 1
Yields of 3 varieties of sugarcane at 4 locations, 1966-69

Crop and variety	Yields at—											
	Meridian, MS			Poplarville, MS			Brewton, AL			Cairo, GA		
	Cane per acre (tons)	Syrup per ton of cane (gallons)	Syrup per acre (gallons)	Cane per acre (tons)	Syrup per ton of cane (gallons)	Syrup per acre (gallons)	Cane per acre (tons)	Syrup per ton of cane (gallons)	Syrup per acre (gallons)	Cane per acre (tons)	Syrup per ton of cane (gallons)	Syrup per acre (gallons)
Plant cane:												
CP 36-111	34.5	15.0	508	51.4	18.4	946	23.8	18.7	450	34.5	18.5	635
CP 52-48	39.8	15.8	671	63.2	16.8	1,062	34.0	19.2	645	46.3	17.9	830
CP 67-500	33.1	15.7	572	50.2	18.9	949	25.9	19.7	503	39.5	20.4	804
1st-year stubble:												
CP 36-111	32.9	15.7	523	52.1	19.9	1,037	37.5	21.1	784	23.2	17.9	416
CP 52-48	36.4	15.7	562	56.6	17.8	1,025	44.6	19.9	873	37.4	18.2	682
CP 67-500	29.8	16.4	497	50.2	20.5	1,029	23.5	22.2	789	32.6	19.6	645
2d-year stubble:												
CP 36-111	25.4	15.9	401	...	...	...	39.5	18.7	740	15.7	17.4	274
CP 52-48	28.4	16.0	454	...	...	...	47.9	18.3	879	21.2	18.2	383
CP 67-500	25.9	17.0	459	...	...	...	40.2	0.0	816	22.8	20.3	464
Average for 3 years:												
CP 36-111	30.9	15.5	477	51.8	19.2	992	33.6	19.5	658	24.5	17.9	442
CP 52-48	34.9	15.8	562	60.4	17.3	1,044	42.2	19.1	799	35.0	18.1	665
CP 67-500	29.6	16.4	509	50.2	19.7	989	29.8	20.7	703	31.6	20.1	638

1. Name the three states mentioned in the chart above: Mississippi, Alabama, Georgia, Florida, South Carolina, Texas.
2. How many acres of sugar cane were grown in Florida in 1880?
9,345 acres
3. Was there more sugar or molasses produced in Florida? Sugar
4. Why is this chart interesting to look at when studying sugar cane? (hint: what is the purpose of this chart) Various answers are correct. This chart allows us to see the amount of sugar cane syrup that can be produced from sugar cane. And allows us to compare the crop over several different states.



Name: _____ Date: _____

Post-Trip Lesson Plan Sugar Cane Industry

Instructions: Please read the passage below then answer the following questions.

The Sugar Cane Industry

By George T. Surface

Assistant Professor of Geography, Sheffield Scientific School, Yale University,
New Haven, Conn.

1910

The sugar cane industry constitutes one of the staple agricultural resources of the southern Gulf States. Not only this region but all of the southern states are under the financial and economic tension of phenomenal industrial growth and evolution. This is having the effect of diversifying production and enlarging the facilities for distribution. The construction operations of the cities and towns rival in vigor the cultivation operations of the country, and the rush is on for the vantage ground between domestic and visiting capital. Obviously, the situation is peculiarly interesting both to the combatant and to the onlooker. We shall hope to inspire some interest in the consideration of the position sugar cane is to hold in the economic struggle.

George T. Surface. "The Sugar Cane Industry." Annals of the American Academy of Political and Social Science, Vol. 35, No. 1, The New South (Jan., 1910), Sage Publications Inc. pp.25.

Questions:

What states are the southern Gulf States:

What would be the advantage of exporting the sugar out of the country? (hint: and increase in exports increases the U.S. money supply)

What effect does the industrial growth and evolution have on sugar cane production?

What happened prior to 1910 that prompted industrial development? (hint: name of period starts with industrial)

Define the word phenomenal in relation to the text.



Post-Trip Lesson Plan
Sugar Cane Industry
Answers

Instructions: Please read the passage below then answer the following questions.

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The sugar cane industry constitutes one of the staple agricultural resources of the southern Gulf States. Not only this region but all of the southern states are under the financial and economic tension of phenomenal industrial growth and evolution. This is having the effect of diversifying production and enlarging the facilities for distribution. The construction operations of the cities and towns rival in vigor the cultivation operations of the country, and the rush is on for the vantage ground between domestic and visiting capital. Obviously, the situation is peculiarly interesting both to the combatant and to the onlooker. We shall hope to inspire some interest in the consideration of the position sugar cane is to hold in the economic struggle.

George T. Surface. "The Sugar Cane Industry." Annals of the American Academy of Political and Social Science, Vol. 35, No. 1, The New South (Jan., 1910), Sage Publications Inc. pp.25.

Questions:

What states are the southern Gulf States:

Florida, Texas, Georgia, Mississippi, Louisiana, Alabama

What would be the advantage of exporting the sugar out of the country? (hint: and increase in exports increases the U.S. money supply)

Exporting the sugar can allow for economic growth, and for an increase in the U.S. money supply

What effect does the industrial growth and evolution have on sugar cane production?

"the effect of diversifying production and enlarging the facilities for distribution."

What happened prior to 1910 that prompted industrial development? (hint: name of period starts with industrial) Industrial revolution, or Industrialization

Define the word phenomenal in relation to the text. Outstanding growth in the



sugar cane industry.

Compose a short narrative of a sugar cane farmer in 1910. You may discuss the process of producing sugar cane, a day in the life of the farmer, or how the sugar cane industry is growing. Be creative.

Answers will vary.