



## CTAE

### UNIT 10.8: George Washington Carver and CTAE

#### INTRODUCTION

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##### **Annotation:**

George Washington Carver was a great scientist and teacher. He was a master of the applied sciences. He is a great role model for Career, Technical and Agricultural Education students who aspire to influence their areas of expertise, as Carver did in his field. It is suggested that CTAE classes use the study of George Washington Carver's life and contributions to help celebrate Black History Month.

This unit teaches students about the life and influence of one of the most renowned agricultural scientists of all time—George Washington Carver. This unit is especially appropriate during Black History Month. Students will learn about Carver's biography and some of the products he is famous for. They will have the opportunity to extend Carver's agricultural chemistry approach to their own pathway, as well as research how other innovators have changed the pathways throughout history.

**Special Note:** Teachers may wish to pick and choose lessons based on their CTAE area and time available.

##### **Grade(s):**

X	6th
X	7th
X	8th

X	9th
X	10th
X	11th
X	12th

##### **Time:**

5- 50 minute class periods

##### **Author:**

Dallas Duncan and Dr. Frank B. Flanders

##### **Students with Disabilities:**

For students with disabilities, the instructor should refer to the student's IEP to be sure that the accommodations specified are being provided. Instructors should also familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation.

## FOCUS STANDARDS

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### GPS Focus Standards:

**CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations**

### GPS Academic Standards:

**SSUSH10 The student will identify legal, political, and social dimensions of Reconstruction.**  
b. Explain efforts to redistribute land in the South among the former slaves and provide advanced education (Morehouse College) and describe the role of the Freedmen's Bureau.  
c. Describe the significance of the 13th, 14th, and 15th amendments.

**SCSh6 Students will communicate scientific investigations and information clearly.**  
d. Participate in group discussions of scientific investigation and current scientific issues.

**SBO6 Students will analyze the economic and ecological importance of plants in society.**  
a. Explain the uses and values of plants in different societies (agriculture, horticulture, industry, medicine, biotechnology).

**AG-BAS-1 The student evaluates human needs and demonstrates the role of agriculture in meeting the needs of humans: historically, currently, and in the future.**  
d. Traces major changes and accomplishments in the history of agriculture.  
h. Discusses the skills needed for agricultural work and explains how they have changed.

### National / Local Standards / Industry / ISTE:

## UNDERSTANDINGS & GOALS

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### Enduring Understandings:

- Students will understand how chemistry, creativity, and innovative thinking can change their field of study or profession.

### Essential Questions:

- Why should we study George Washington Carver?
- How did George Washington Carver rise from slavery to become a famous agriculturalist?
- What contributions did Tuskegee Institute — now known as Tuskegee University — make to George Washington Carver's career?
- How did George Washington Carver's products and inventions change agriculture?
- How can chemistry be used successfully in different careers?
- How have innovative thinkers changed your pathway?

### Knowledge from this Unit:

Students will:

- Explain George Washington Carver's contributions to modern agriculture.

- Evaluate how chemistry is used in their individual pathway.
- Define and discuss vocabulary associated with George Washington Carver.
- Discuss the individuals who changed their pathway.

### Skills from this Unit:

Students will:

- Create an artistic display to represent George Washington Carver's biography and his products.
- Research and present a poster about an innovative minority leader in their pathway.

## ASSESSMENTS

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### Assessment Method Type:

- Pre-test
- Objective assessment - multiple-choice, true- false, etc.
  - Quizzes/Tests
  - Unit test
- Group project
- Individual project
- Self-assessment - May include practice quizzes, games, simulations, checklists, etc.
  - Self-check rubrics
  - Self-check during writing/planning process
  - Journal reflections on concepts, personal experiences and impact on one's life
  - Reflect on evaluations of work from teachers, business partners, and competition judges
  - Academic prompts
  - Practice quizzes/tests
- Subjective assessment/Informal observations
  - Essay tests
  - Observe students working with partners
  - Observe students role playing
- Peer-assessment
  - Peer editing & commentary of products/projects/presentations using rubrics
  - Peer editing and/or critiquing
- Dialogue and Discussion
  - Student/teacher conferences
  - Partner and small group discussions
  - Whole group discussions
  - Interaction with/feedback from community members/speakers and business partners
- Constructed Responses
  - Chart good reading/writing/listening/speaking habits
  - Application of skills to real-life situations/scenarios
- Post-test

### Assessment Attachments and / or Directions:

Unit Exam – George Washington Carver  
 Unit Exam Key – George Washington Carver

# LESSON PLANS

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## • LESSON 1: Who was George Washington Carver?

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1. Identify the standards. Standards should be posted in the classroom.

**CTAE-FS-10** Career Development: Learners plan and manage academic-career plans and employment relations.

**SSUSH10** The student will identify legal, political, and social dimensions of Reconstruction.  
b. Explain efforts to redistribute land in the South among the former slaves and provide advanced education (Morehouse College) and describe the role of the Freedmen's Bureau.  
c. Describe the significance of the 13th, 14th, and 15th amendments.

**SCSh6** Students will communicate scientific investigations and information clearly.  
d. Participate in group discussions of scientific investigation and current scientific issues.

**SBO6** Students will analyze the economic and ecological importance of plants in society.  
a. Explain the uses and values of plants in different societies (agriculture, horticulture, industry, medicine, biotechnology).

**AG-BAS-1** The student evaluates human needs and demonstrates the role of agriculture in meeting the needs of humans: historically, currently, and in the future.  
d. Traces major changes and accomplishments in the history of agriculture.  
h. Discusses the skills needed for agricultural work and explains how they have changed.

2. Review Essential Question(s). Post Essential Questions in the classroom.

- Why should we study George Washington Carver?
- How did George Washington Carver rise from slavery to become a famous agriculturalist?

3. Identify and review the unit vocabulary. Terms may be posted on word wall.

Botanist	Humility	NAACP
Cardinal	Innovation	Perseverance
Cash Crop	Legacy	Pragmatic
Extension	Legume	Self-Sufficiency
Frugality	Monoculture	Tuskegee Airmen
Horticulture	Mycology	Virtue
Humanitarian	Pathology	Vocational

4. Interest approach – Mental set

Lead a discussion by asking students:

- Why do we celebrate Black History Month?
- Who are some famous African Americans you can think of?
- Who are some famous African Americans in your career pathway?
- What contributions did these people make?

5. Who was George Washington Carver?

- Ask students, “What do you know about George Washington Carver?”
  - View the **“Who was George Washington Carver?” PowerPoint**
    - See attached supplementary files.
6. Discuss some of the people, places and organizations mentioned in the PowerPoint.
- Who was Booker T. Washington?
    - What contributions did he make to society?
    - What made Booker T. Washington famous?
  - What is the NAACP?
    - The NAACP is the nation’s oldest, largest and most well-known grassroots civil rights organization.
    - When was the NAACP founded?
      - Answer: 1909
    - What was the original purpose of the NAACP when it was founded?
      - To secure the rights guaranteed in the 13<sup>th</sup>, 14<sup>th</sup>, and 15<sup>th</sup> amendments for each person
7. How was George Washington Carver’s childhood different from that of other African American children during that time period?
- He and his brother, Jim, were raised by their owners after his mother was kidnapped.
  - He was a sickly child even though he was well-cared for.
  - The Carvers taught George to appreciate and respect nature. He was encouraged to explore the world around him.
  - George and Jim started to attend a school for primarily white children because their town did not have enough African American children to create a separate school for them.
  - Because George was a sickly child, he spent a lot of time with Susan Carver, who taught him “womanly” skills like sewing, cooking, laundering, and needlework.
8. Summary
- Ask students, at random, to name one thing they have learned about George Washington Carver.
  - Ask students what adversities they have had to overcome.
  - Ask the class if any of them faced greater adversity than George Washington Carver.
  - Ask students, “Would you agree that if George Washington Carver can overcome slavery, discrimination, and other hard times to become one of the greatest scientists of all time, then most of us can excel as well?”

• **LESSON 2: George Washington Carver and Tuskegee University**

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1. Review Essential Questions. Post Essential Questions in the classroom.
  - What contributions did Tuskegee Institute — now known as Tuskegee University — make to George Washington Carver’s career?
2. Lead a discussion about Tuskegee University.
  - Where is Tuskegee University?
  - What programs of study does Tuskegee offer?
  - How do you think Tuskegee has changed since it was founded by Booker T. Washington?
3. How did Tuskegee teach students the importance of agriculture?
  - Students were taught agricultural education and extension.
    - How is agricultural extension used today?

- Tuskegee had a school farm students could both work at and eat from.
    - What advantages could a school farm or garden have at our school?
    - How does teaching students how to farm benefit them?
    - What are some challenges students might have faced if all they had to eat was from the school farm?
      - Examples: crop failure, poor diet if students didn't like what was being grown
  - What challenges did Tuskegee face during its early years?
    - How could vocational-based programs for African Americans be seen as a negative?
    - Why was money a problem during this time?
4. George Washington Carver and Tuskegee
    - How did George Washington Carver's appointment as head of the Institute's Department of Agriculture affect his career?
    - Why do you think George Washington Carver decide to accept the job offer?
    - What are cardinal virtues?
    - George Washington Carver was very interested in the character development of his students. Have students complete the **Cardinal Virtues Discussion Worksheet**. The associated **Cardinal Virtues Poster** can either be used as a handout for each student, or one copy can be posted in the classroom.
      - See attached supplementary files
  5. The Tuskegee Airmen
    - Who were the Tuskegee Airmen?
      - Answer: They were America's first African American military airmen, who fought during WWII. They were trained at Tuskegee University.
    - Why do you think the Tuskegee Airmen were important?
  6. Have students go to [www.tuskegee.edu](http://www.tuskegee.edu) and briefly research a program of study they would be interested in and share their reasoning with the class.

### • **LESSON 3: Carver's Products**

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1. Review Essential Questions. Post Essential Questions in the classroom.
  - How did George Washington Carver's products and inventions change agriculture?
2. Pass out copies of the **George Washington Carver's Products** worksheet and lead students in a discussion about some of the listed products. See attached supplementary files.
  - Which of these products are familiar to you?
  - Do you use any of these products on a daily basis?
  - Are any of these products used in your pathway?
3. Have students research one of the products listed on the worksheet and present them to the class, following the instructions on the **Products Presentation Guidelines**.
  - See attached supplementary files.
4. During February—Black History Month—have the students build a display of the products they researched and presented to the class.
  - The display should be in a public area of the school, such as in a front office display case.
  - A "Black History Month" sign can be created to incorporate in the display.
  - Print the large **GW Carver Portrait** to incorporate as well.

- If students did not research the raw commodities, such as sweet potatoes and peanuts, make sure they are included in the display as well along with the processed products students bring in.

#### • Lesson 4: Chemistry

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1. Review Essential Questions. Post Essential Questions in the classroom.
  - How can chemistry be used successfully in different careers?
2. Lead a discussion about how George Washington Carver used chemistry.
  - How did chemistry help George Washington Carver become well-known?
  - What products do you think chemistry helped create?
  - Can chemistry benefit agriculture?
  - Does using chemistry have any repercussions for agriculture?
3. How is chemistry used in your pathway?
  - Have students list on the board ways chemistry can be used in their pathway. Try to have at least one use for each pathway. Some examples are listed below:
    - Animal Science: Chemistry can be used to determine how animals' digestive systems break down different nutrients in feeds
    - Agribusiness: Medical companies use chemistry to create new products
    - Fashion Marketing: Creating various textile dyes from different chemicals
    - Graphics, Advertising and Marketing: Chemistry helps create the materials used in creating computer inks and the plastics for billboards
    - Plant Sciences: Chemistry helps in creating fertilizers and deciding which ones work best with which plants

#### • Lesson 5: Other Innovative African Americans

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1. Review Essential Questions. Post Essential Questions in the classroom.
  - How have innovative thinkers changed your pathway?
2. Lead a discussion about innovations.
  - What is an innovation?
    - Answer: Something newly introduced
  - What are some examples of agricultural innovations?
    - Examples:
      - New technology and equipment, such as GPS
      - High fructose corn syrup
      - High-definition television
  - Do we use any of these innovations on a regular basis?
  - Name some innovations specific to your pathway.
3. Innovators
  - Have students brainstorm and list on the board some famous innovators. List as many African Americans as possible; others may be listed as well.
    - Examples:
      - Percy Julian, who created Cortisone
      - Emmett Chappelle, who worked with NASA
      - Benjamin Banneker, the "first African American inventor"

- Why do these people gain so much attention?
  - Have students research a famous agriculturalist in their pathway following the **Innovator Presentation Guidelines**.
    - See attached supplementary files.
4. Summary
- Ask students, at random, what they have learned about African American innovators.

• **ATTACHMENTS FOR LESSON PLANS**

- [Unit Vocabulary Glossary](#)
- [Who was George Washington Carver? PowerPoint](#)
- [Cardinal Virtues Poster](#)
- [Cardinal Virtues Discussion Worksheet](#)
- [George Washington Carver's Products Handout](#)
- [Products Presentation Guidelines](#)
- [George Washington Carver Photo](#)
- [Innovator Presentation Guidelines](#)

## CULMINATING PERFORMANCE TASK

**Culminating Unit Performance Task Title:**

Build a display of products that George Washington Carver invented or improved. The display should be in a public area of the school such as in the front office display case.

**Culminating Unit Performance Task Description/Directions/Differentiated Instruction:**

See Lesson 3 for details.

**Attachments for Culminating Performance Task:**

- [George Washington Carver's Products Handout](#)
- [Product Presentation Guidelines](#)
- [GW Carver Portrait](#)

## UNIT RESOURCES

**21<sup>st</sup> Century Technology Used:** Type an "X" in the boxes to indicate 21<sup>st</sup> century technology used in this lesson.

<input checked="" type="checkbox"/>	Slide Show Software	<input type="checkbox"/>	Graphing Software	<input type="checkbox"/>	Audio File(s)
<input type="checkbox"/>	Interactive Whiteboard	<input type="checkbox"/>	Calculator	<input type="checkbox"/>	Graphic Organizer
<input type="checkbox"/>	Student Response System	<input type="checkbox"/>	Desktop Publishing	<input checked="" type="checkbox"/>	Image File(s)
<input type="checkbox"/>	Web Design Software	<input type="checkbox"/>	Blog	<input type="checkbox"/>	Video
<input type="checkbox"/>	Animation Software	<input type="checkbox"/>	Wiki	<input type="checkbox"/>	Electronic Game or Puzzle Maker
<input type="checkbox"/>	Email	<input checked="" type="checkbox"/>	Website		



