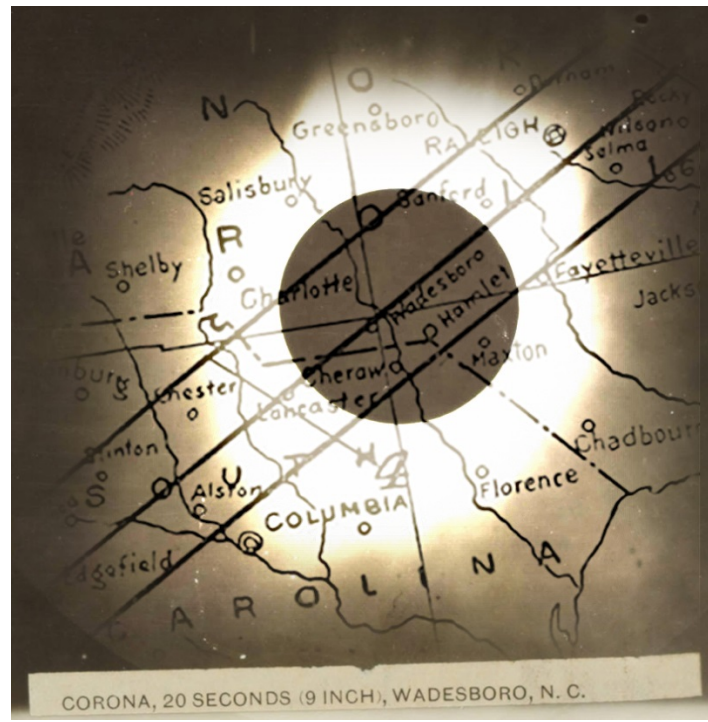




Discover the Solar Eclipse of 1900 in Historic Wadesboro, NC:

A Lightning Lesson from Teaching with Historic Places



Events like a total solar eclipse have made humans tremble with curiosity, wonder, and fear for millennia. Our civilizations developed science, philosophy, and mathematics to make sense of the universe and to explore our place in it.

On May 28, 1900, a solar eclipse passed over North America. The line of **totality** crossed directly over the town of Wadesboro, North Carolina. Founded in 1783 by Revolutionary War patriots, the town was a major cotton producer for global markets in the 19th century. Cotton trade faded, but in the early 20th century, the totality event of 1900 transformed Wadesboro into a hotspot for science.

The era's foremost astronomers anticipated the event and knew Wadesboro would be a prime spot to study it. Wadesboro's location, climate, and geographical features promised scientists a clear view. Its citizens welcomed the visitors into their homes. In this STEAM lesson, discover the role historic Wadesboro played in humankind's journey to understand our universe.



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About this Lesson

This lesson plan is based on the National Register for Historic Places nominations for the [Wadesboro Downtown Historic District](#) and the [Boggan-Hammond House and Alexander Little Wing](#). *Discover the Total Eclipse in Wadesboro, North Carolina: A Lightning Lesson from Teaching with Historic Places* was published in 2017. This lesson was written by National Park Service contractors, Beth Pruitt and Maria A. Lee Strohmayer. It was edited by National Park Service historian Katie Orr and the Cultural Resources Office of Interpretation and Education staff in Washington, D.C. This lesson is one in a series that brings the important stories of historic places into classrooms across the country.

Objectives

1. To identify Wadesboro, North Carolina's location on map and explain why scientists chose it as a place to study the total solar eclipse of 1900.
2. To explain what a solar eclipse is and describe ways humans experience the event;
3. To demonstrate their understanding of one of three topics covered in an optional activity: Total Solar Eclipses around the world and the importance of a global perspective; The movement of the Moon's shadow on the Earth during a solar eclipse done through role-play; Light pollution in your community and the value of dark skies.

Materials for Students

1. A map showing the path of visibility of the total solar eclipse on May 28, 1900;
2. A secondary source reading about the 1900 total solar eclipse in Wadesboro;
3. An excerpt from a government document from the Smithsonian Institution about interactions with the townspeople of Wadesboro during the solar eclipse
4. One historic photograph of the scientists at Wadesboro with their equipment in preparation for the eclipse



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About the Place

The Wadesboro Downtown Historic District is in Wadesboro, North Carolina. The Town of Wadesboro provides information about accommodations, attractions, arts and historical museums, and other visitor resources online [<http://www.townofwadesboro.org/around-wadesboro.html>]. The Anson County Historical Society Museum is located at 206 East Wade Street, Wadesboro, NC [<http://www.ansonhistoricalsociety.org/>].

Time Period: Early 20th century

Topics: This lesson could be used in middle and high school units relating to astronomy, geography, and the history of modern science.

Relevant Next Generation Science Standards

This lesson relates to the following Next Generation Science Standards for the Middle School level [<https://www.nextgenscience.org/pe/ms-ess1-1-earths-place-universe>].

MS-ESS1-1 Earth's Place in the Universe

- **MS-ESS1-1:** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

Relevant Curriculum Standards for Social Studies

This lesson relates to the following Curriculum Standards for Social Studies from the National Council for the Social Studies [<http://www.socialstudies.org/standards/teacherstandards>]:

- Theme II: Time, Continuity, and Change
- Theme III: People, Places, Environments
- Theme V: Individuals, Groups, and Institutions
- Theme VIII: Science, Technology, and Society
- Theme IX: Global Connections



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Relevant Common Core Standards

This lesson relates to the following Common Core English and Language Arts Standards for

History and Social Studies for middle and high school students

[\[http://www.nchs.ucla.edu/history-standards/common-core-standards-1-1\]](http://www.nchs.ucla.edu/history-standards/common-core-standards-1-1):

Key Ideas and Details

- CCSS.ELA-Literacy.RH.6-12.1
- CCSS.ELA-Literacy.RH.6-12.2

Craft and Structure

- CCSS.ELA-Literacy.RH.6-12.5
- CCSS.ELA-Literacy.RH.6-12.6

Integration of Knowledge and Ideas

- CCSS.ELA-Literacy.RH.6-12.7



Getting Started Prompt

What is a “total solar eclipse”?

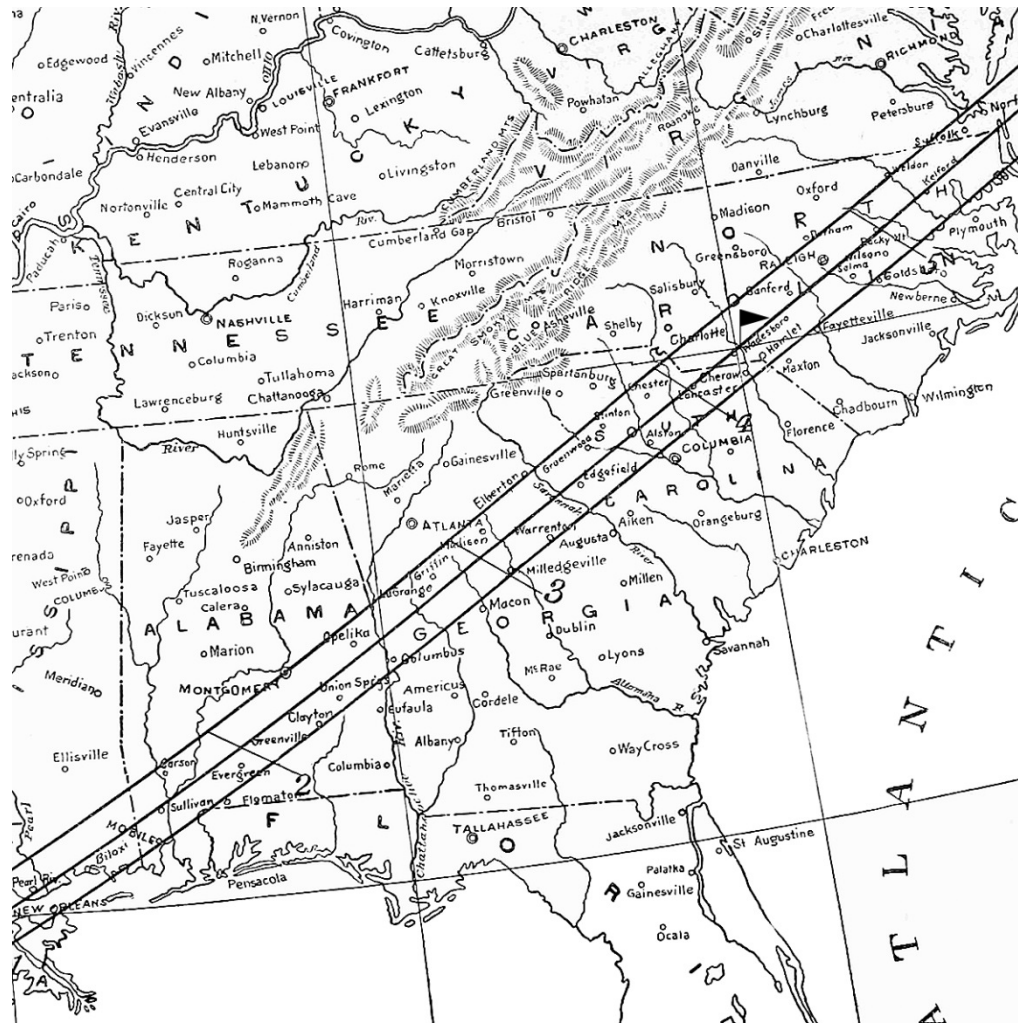
What historic place might you study to answer this question?
Why?



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Locating the Site

Map 1: Path of Totality during the May 28, 1900 Solar Eclipse.



Source: *The Popular Science Monthly*. 1900. Volume 57.

A *total solar eclipse* is an event when the moon's orbit brings it directly between the Earth and the Sun. Some parts of Earth fall along the path of *totality* during an eclipse. Observers within totality see the sun disappear completely when the moon passes between it and the Earth.

Map 1 shows the path of totality across southeastern North America on May 28, 1900. The middle line shows where observers saw the sun "totally" blocked out by the moon. The two outer lines show where the eclipse was near totality with some parts of the sun still visible.



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Questions for Map 1

1. What states were in the path of totality in 1900?
2. Why might someone within the path of totality, looking up on May 28, not be able to see the eclipse? *Hint: Think about what might make it difficult to see the sun on any day.*
3. Locate the town of Wadesboro, North Carolina. (Marked with the flag) In a sentence, explain what happened there on May 28, 1900. What evidence from the map supports your answer?



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Reading 1: Wadesboro, NC, and the Solar Eclipse of 1900

Imagine a dark shadow passing over the Sun in the middle of the day. The light grows dim until the shadow swallows the Sun completely. A glow surrounds the dark circle in the sky where the Sun used to be. Planets and stars appear in the darkness. Nocturnal animals come out to feed. Dogs bark. The temperature drops 10 degrees Fahrenheit. The world is quiet and eerie. After a minute or two, the shadow retreats. The total solar eclipse, an event called *totality*, ends. The sky brightens, stars disappear, and the world returns to normal.

A solar eclipse occurs when the Moon passes between the Earth and the Sun. A total solar eclipse happens when the moon completely covers the Sun. During totality, only the Sun's outermost layer, the corona, is visible.

On May 28, 1900, a solar eclipse swept across the United States, from New Orleans, Louisiana, to Norfolk, Virginia, and some parts of the Earth experienced totality. The world's leading European and American scientists of the era knew the eclipse would happen. They traced the path of totality and decided to observe it in a small town called Wadesboro, North Carolina. The town was the prime location because of its climate and elevation. It was also near a railway and could host visitors. The most scientifically advanced records and observations of the eclipse that day happened in Wadesboro.

Astronomers have used geometry and algebra to predict eclipses for centuries. By the late 1890s, scientists could determine the time and locations of an eclipse down to the second and single kilometer. Smithsonian scientists from Washington, D.C. chose Wadesboro years before the event. They researched cloud cover and weather patterns along the eclipse's path for three years. Predicting a clear sky, they determined that Wadesboro would be the best bet for over 100 miles in either direction.

In the spring of 1900, excited scientists arrived in Wadesboro from all over the world. They came from important research organizations like the Yerkes Observatory in Chicago, Illinois, and the British Astronomical Association in London, England. Wadesboro citizens gave them a warm welcome. The visitors stayed at local hotels and private homes. Some of these historic buildings are still standing. The scientists became so involved with the Wadesboro community that a few joined the local church choir.



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The scientists did not arrive with just notebooks and pencils in hand: they brought the most advanced recording equipment, telescopes, and cameras of their time to Wadesboro. The Smithsonian scientists' equipment filled whole train cars and arrived by railroad. One camera was 135 feet long and had a 12-inch lens. The scientists used these tools to study the wavelengths of light from the Sun's corona. They took high quality photographs of Venus, Mercury, and other stars. They also tried (and failed) to discover a new planet.

Totality lasted two minutes and ten seconds in Wadesboro on the day of the eclipse. Hundreds of residents and visitors packed the streets, windows, and roofs of buildings for the best view. Tense and focused, the scientists worked quickly to make the most of every second.

After the event, the scientists eagerly packed up their equipment, records, and suitcases. They wanted to return to their universities and research labs to analyze the new data. Wadesboro residents returned to their normal lives as well, but with an increased sense of pride in their historic town.

A century later, the Secretary of the Interior designated the Downtown Wadesboro Historic District in 1999 and it was listed in the National Register for Historic Places. This is the official list of historic places in the United States. Wadesboro is important to the nation's history because of its cotton production and the eclipse of 1900. The district includes historic houses, cotton mills, and local government buildings. Scientists stayed in some of these buildings during their visit. In 2003, the Anson County school system and the Wadesboro Rotary Club sponsored a planetarium and science center. The center organizes educational programs for students about the 20th century eclipse and features special telescopes and software for viewing the night sky.

Remember that it is never safe to look directly at the Sun, even during a total solar eclipse. The sun's indirect rays can damage your eyes and regular sunglasses will not protect you. Safe viewing involves wearing special glasses with solar filters.



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Questions for Reading 1

1. Who visited Wadesboro, North Carolina, in May of 1900 and what happened during the visit? List three reasons why this group chose Wadesboro over other towns.

2. How is the history and legacy of Wadesboro recognized by the United States? How do the town's residents recognize it?

3. Historians and scientists ask questions about big ideas to guide their research. What *questions* about the solar system might the scientists try to answer by studying the eclipse? Use information from the reading and give three examples written as interrogative sentences.



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Reading 2: Report on the Relations between Smithsonian Visitors and the Townspeople of Wadesboro, 1904.

This is an extract from a report written by Samuel P. Langley and Charles G. Abbot, who helped lead the Smithsonian expedition to Wadesboro.

The ground occupied was a sod-covered level field [...] on the edge of town. Mr. Abbot visited Wadesboro early in April to lay off the ground, and arranged with a local contractor to erect a shed for the apparatus, and to provide material required for piers and support of apparatus. Accommodations were engaged for the party at the National Hotel, Wadesboro. The proprietor, Mr. Huntley, did his utmost to make arrangements for the unusual number of these and other eclipse guests, and at all times cared for their comfort.

The townspeople of Wadesboro manifested a lively interest in the eclipse preparations; and not only were they interested, but helpful, and they treated the observed with marked cordiality. After the arrival of the parties a meeting was held by the townspeople and a committee appointed to assist the astronomers in any possible way.

As a further act of hospitality several carriages were placed at the disposal of such of the guests as chose to ride, and finding that in the press of preparation this kindly offer could not be improved so much as the people could have liked, the carriages were made to call regularly to convey the observers to and from the hotels to the camps, morning, noon, and night. Along with this public cordiality, private hospitalities were not wanting, and one and all of those who observed at Wadesboro must join in acknowledgement of the courtesies received.

As some slight return one or more of the Smithsonian party was usually in attendance at the 5-inch visual telescope on fair nights to show celestial objects to such as wished to look, and quite a number of people gathered there every night and seemed to enjoy the opportunity.

Provision was made by the town authorities for effectually guarding the grounds from intrusion on the day of the eclipse. The whole space was roped off, the nearest street closed, and special constables prevented all approach until after the eclipse had passed.

Langley, Samuel P., and Charles G. Abbot. *The 1900 Solar Eclipse Expedition of the Astrophysical Observatory of the Smithsonian Institution*. Washington: Government Printing Office, 1904. <https://archive.org/stream/1900solareclipse00smitrich>.



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Questions for Reading 2

1. How did the residents of Wadesboro, North Carolina, help the scientists in 1900?
2. What kinds of buildings did the scientists need in Wadesboro? What kinds of outdoor spaces did they use in the town? List two more ways you think the town and its residents supported the scientists. What evidence from Reading 2 supports your theory?
3. In your own culture or society, how do you think reactions to solar eclipses have changed over time? How might they have stayed the same? Why do you think so?



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Visual Evidence

Photo 1: British Astronomical Association with their equipment in Wadesboro, NC



Source: [North Carolina Photographic Archives, Louis Round Wilson Special Collections Library](#)



Optional Activity 1

Charting Solar Eclipses around the World

Total solar eclipses occur two to five times per year around the Earth. Since there can be many decades in between a total solar eclipse in the United States, there can sometimes be the misconception that solar eclipses are rare. Ask students to create a chart that outlines the date, duration, and path of totality (geographical locations) where total solar eclipses occurred in the last fifty years. Emphasize that the chart should show eclipses that were visible around the world and not solely the United States. This data can be found online at NASA “Decade Solar Eclipse Tables” [<https://eclipse.gsfc.nasa.gov/solar.html>].

Next, have students represent the countries and geographical regions on their charts in a graph, map, or other visual form. Display the students’ visual presentations in a classroom exhibit. In a class discussion, ask students what they learned during the project and how different their conclusions would be if their charts only identified solar eclipses that were visible in the United States. Finally, discuss whether or not students see value in having a global perspective and/or when studying astronomy, geography, and science.



Optional Activity 2

Lights, Camera, Action: A Solar Eclipse in Motion

In this activity, students design models of the heavenly bodies and use a flashlight to simulate sunlight to recreate a solar eclipse. Break your class up into groups of four and assign each student in the group to design a model of the Sun, Earth, or Moon. The fourth student will hold a flashlight to simulate sunlight and also act as team leader to direct the solar eclipse.

To create the models, students can use common household or classroom materials such as cardboard, computer paper, or sports balls (basketballs, baseballs, etc.). Once the student groups have their models, turn off the lights in the classroom. The team leaders will stand by the model Sun, turn on their flashlights, and direct the other student's movements so everyone can see the model Moon's shadow moving across the model Earth.

If possible, record the student's preparations and their role-playing moments to create a video that can be posted on a classroom YouTube channel or school blog.



Optional Activity 3

Get involved! Light Pollution and Night Skies in Your Community.

Astronomers chose Wadesboro as the best place to view the 1900 solar eclipse because of its clear skies and rural location. Air quality and cloud cover determine how easy it is to observe the night sky, natural landscapes, and other features of the night. Just as there is pollution from cars or waste, there is also something called light pollution. The lights from streets and buildings make it more difficult to see the stars. This is why there appear to be more stars in the sky the farther an observer is from a large city.

Introduce the idea of light pollution to the class. Use the New World Atlas map to observe the extent of light pollution across the globe

[\[https://cires.colorado.edu/artificial-sky\]](https://cires.colorado.edu/artificial-sky). Zoom into your state and local community. Ask students to identify whether or not their local community or an area in their state has a high level of brightness.

If light pollution is a local issue, assign students to write a persuasive essay on why light pollution is harmful to natural environments and how members of the community could reduce light pollution. If light pollution is not a local issue, assign students to write a similar persuasive essay to a neighboring state.

If there's time left, turn the lesson into civic action by asking the students to sign their names on printed copies of the essays and submit them to a local government representative or body. The government office will likely respond to the students with a signed letter from a local leader, thanking them for sharing their thoughts. Read the letter to the students and post it on the classroom wall.



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References and Contributing Resources

Heliophysics Science Division. "NASA Eclipse." NASA Goddard Space Flight Center. <https://eclipse.gsfc.nasa.gov/eclipse.html>.

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Additional Online Resources

National Park Service

The National Park Service provides an online resource on natural phenomena that includes eclipses

[<https://www.nps.gov/subjects/naturalphenomena/eclipses.htm>]. It features photographs and maps of types of eclipses, eye safety, and information on upcoming solar eclipses. There are also website navigation links to park events along the path of totality of the 2017 solar eclipse

[<https://www.nps.gov/subjects/naturalphenomena/2017eclipse.htm>].

Town of Wadesboro

The Anson County government page for the Downtown Wadesboro Historic District contains historical and contemporary photographs of town buildings and landscapes on their website [<http://www.townofwadesboro.org/history-of-wadesboro.html>].

National Aeronautics and Space Administration (NASA)

NASA offers a centralized space to study solar eclipses, lunar eclipses, and other movements of planetary objects under its main “NASA Eclipse Website” page. [<https://eclipse.gsfc.nasa.gov/eclipse.html>]. This place also offers information about the 2017 eclipse, eye safety, and predictions for when a total solar eclipse will occur in specific areas.

NASA explains equinoxes, solstices, full moons, and eclipses on their website “NASA Satellites Ready When Stars and Planets Align”

[<https://www.nasa.gov/feature/goddard/2017/nasa-satellites-ready-when-stars-and-planets-align>].

Google Sky

The Google Sky resource compiles data from observatories around the world to provide an interactive website to view real-time locations of planets, constellations, galaxies, and nebulae. It offers views of the universe in x-ray, ultraviolet, and infrared as well as publishes podcasts on upcoming astronomical events. [<https://www.google.com/sky/>]



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American Astronomical Society

The American Astronomical Society offers educational materials with links to online courses, lesson plans, and videos about lunar and solar eclipses [<https://eclipse.aas.org/resources/educational-materials>]. The AAS also provides a resource on preparing for the Eclipse and safely observing the Sun. [<https://eclipse.aas.org/sites/eclipse.aas.org/files/Hurst-et-al-S%26C-Mar2017.pdf>].