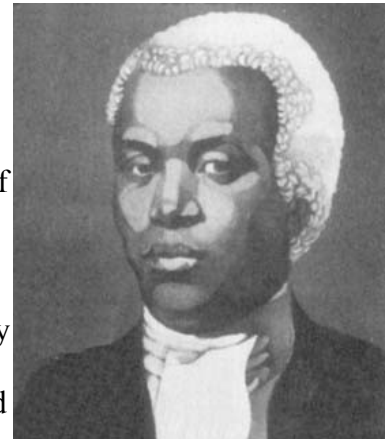


## Benjamin Banneker

Among the most remarkable early American mathematicians was

**Benjamin Banneker** (October 9, 1731 – October 9, 1806). His lifetime of achievements convincingly refuted the belief that whites of the time adopted to soothe their consciences for embracing or tolerating the slavery of others, namely that Blacks were intellectually inferior. Banneker, called



the “first African American inventor,” also made his mark as a farmer, a surveyor, an essayist, an astronomer, and a crusader for the better treatment of his brethren. One of the first African-Americans intellectuals to gain distinction in science, he was internationally known as the “Sable Genius.”

Banneker was born in Baltimore, Maryland, then a British colony. His English grandmother, Molly Walsh worked as a dairymaid on a large farm near Devon, England. One day while doing her chores, a cow kicked over a pail of milk. Her employer accused her of stealing and had her arrested. At that time in England, the penalty for stealing was death on the gallows. Molly was saved this fate because of a provision in the law that reduced the sentence for those who could read the Bible, as she could. Thus instead of death, she was sent to colonial America as an indentured servant in the Maryland colony.

When she completed her seven years of bondage, she was given an ox and cart, some supplies, and her freedom. She bought a tobacco farm and two slaves to help care for it. She freed both slaves and married one, an African named Banne Ka, later changed to Bannaky. The latter was the eldest son of a Dogon king in Africa and was very knowledgeable about agricultural matters. He devised a way to channel water for irrigation, which made it the envy of surrounding farms. When their oldest daughter Mary became of age, she bought a slave named Robert from Guinea, freed him and married him. They had several children, Benjamin the eldest. His father took the last name of his wife.

Using her Bible, Molly taught her grandchildren to read. There was no school for the boys to attend until a Quaker schoolteacher Peter Heinrich moved into the valley. He established one of the first “color-blinded” schools of the time. It was this schoolmaster who changed the spelling of Benjamin’s last name to Banneker, which he believed, sounded more American. As the school was only in session during the winter, he did much of his studying on his own. His aptitude and appetite for mathematics were great. He taught himself from borrowed books, which enabled him to obtain an education well beyond the status of his birth. Banneker officially shared joint ownership of the 100-acre farm with his father. The spread was known as “Bannaky Springs” due to the fresh water springs on the land. His father died in July 1759, leaving Benjamin to run the farm alone.

When Banneker was 22 he became fascinated with the pocket watch of Josef Levi, a visitor from England. Levi lent his watch to Banneker until he again returned from England, but he never made it back, dying at sea. Banneker was determined to build his own clock. He demonstrated his creative genius by approaching the construction of the clock as a mathematical problem. He used the pocket watch, which Levi gave him, as a model. He took it apart to study its mechanism, calculated the relationships of the wheels and gears, made drawings to scale, and then whittled the works for the clock from hardwood. From that point on his expertise was sought in repairing all types of timekeepers: watches, clocks, and sundials. As the first striking clock made completely in America, Banneker’s timepiece was noted for its accuracy, keeping perfect time for well over fifty years. It might have run even longer, but fire at Banneker’s house destroyed the clock on the day of his funeral.

Over the next 20 years, Banneker developed his wide range of abilities in mathematics, surveying, geology, physics, and astronomy. His life was significantly changed in 1771 when the Ellicots moved in to the farm next door. Banneker often visited them and became a close friend of the family. Joseph

Ellicot was an amateur mathematician and astronomer, who lent Banneker books on mathematics, surveying and astronomy, as well as astronomical instruments. Fascinated, Benjamin taught himself the advanced mathematics he needed to become an astronomer. He was so immersed in astronomy that he slept by day in order to be able to watch the heavens at night. He built a “work cabin,” a shed with a skylight, where he spent hour after hour observing the stars. He discovered errors in existing astronomical texts and constructed his own accurate tables. He predicted the solar eclipse that occurred on April 14, 1789, contradicting the forecasts of prominent mathematicians and astronomers of the day.

From 1791 to 1802, Banneker published an annual *Farmer's Almanac*, containing his own calculations. In an era when books were scarce and expensive, found only in the houses of the wealthiest families, the only books in most homes were the Bible and almanacs. The local almanacs included such things as the planetary positions and the times of sunrise, sunset, moonrise, moonset, eclipses, and tides. This was a remarkable achievement for a self-trained astronomer. The process involved in predicting planetary positions, sunrises, eclipses, etc. requires spherical trigonometry. Banneker's almanac also contained fillers he wrote on political and humanitarian issues. When Benjamin Franklin's *Poor Richard's Almanac* became famous, Banneker was called the black “Poor Richard.”

Banneker was a close friend of Benjamin Rush, a colonial doctor and writer who helped raise funds to pay for the American Revolution. A signer of the Declaration of Independence, Rush wrote against the evils of slavery, the death penalty, and alcohol. Benjamin used his almanac to rally support for Rush's plan for a new cabinet post, a Secretary of Peace. Their attempts “to inspire a veneration for human life and horror for war” fell mainly on deaf ears. Banneker reacted to Thomas Jefferson's assertion that Blacks were void of mental endowment by sending the Virginian a copy of his almanac along with a twelve-page letter in which he requested Jefferson's aid in improving the lot of American Blacks. He took Jefferson to task for not extending the right of freedom to Blacks that he demanded for himself

and others of the white race when he wrote the Declaration of Independence.

“This, Sir, was a time when you clearly saw into the injustice of a state of slavery, and in which you had just apprehension of the horrors of its condition. It was now that your abhorrence thereof was so excited, that you publicly held forth this true and invaluable doctrine, which is worthy to be recorded and remembered in all succeeding ages: ‘We hold these truths to be self-evident, that all men are created equal that they are endowed by their Creator with certain unalienable rights, and that among these are, life, liberty, and the pursuit of happiness.’ Here was a time, in which your tender feelings for yourself had engaged you thus to declare, you were then impressed with proper ideas of the great violation of liberty, and the free possession of these blessings, to which you were entitled by nature but, Sir, how pitiable is it to reflect that although you were so fully convinced of the benevolence of the Father of Mankind, and of his equal and impartial distribution of these rights and privileges, which he hath conferred upon them, that you would at the same time counteract his mercies, in detaining by fraud and violence so numerous a part of my brethren, under groaning captivity and cruel oppression, that you should at the same time be found guilty of that most criminal act, which you professedly detested in others, with respect to yourself.”

Jefferson’s response to Banneker’s letter was typical of the mixed signals he often sent when speaking of his position on racial matters. He praised Banneker’s almanac and expressed his delight in seeing proof that the talents of black men equaled those of men of other colors. Yet his response sounded very much like that one would expect from a careful politician.

In 1791 Banneker was appointed astronomer to a six-member team of surveyors headed by Major Andrew Ellicot, Joseph’s cousin, to make the first-ever survey of the Federal District, which is now

Washington, D.C. After a year of work, French architect Pierre L'Enfant, hired to design the capital, stormed off the job, fired for his bad temper, taking all the plans with him. Banneker saved the project by reproducing from memory a complete layout of the streets, parks, and major buildings. This is the capsule version of the matter that is found in many Banneker sources, but in praising the Black surveyor, it seems to discount the efforts of both L'Enfant and Ellicot. When L'Enfant arrived in America in 1777, he joined the Revolutionary army and attained the rank of major of engineers. After the war he settled in New York City where he established himself as an architect. When Congress decided to build the nation's capital on the Potomac, Washington asked L'Enfant to design the overall plan of the city. At the same time, Washington made Andrew Ellicot principal surveyor of the federal district. Joining Andrew in the project were his two brothers Joseph and Benjamin, and sixty-year old Banneker.

L'Enfant had a number of disputes with the district commissioners who had been appointed to oversee the city's development and with Secretary of State Jefferson, who was himself an architect and had his own ideas as to how the city should look. L'Enfant refused to reveal his map of the planned city and he became furious when he discovered that an influential landowner Daniel Carroll was building a mansion on what would be Capital Hill. L'Enfant demanded that the mansion be moved and when Carroll refused, the architect had city workers tear it down. In February 1792 Washington dismissed L'Enfant. It doesn't appear that L'Enfant furiously marched off taking his plans with him. In fact they were incomplete at the time he was fired, but his descriptions and notes (which are now kept in the Library of Congress) were available to Andrew Ellicot, who Washington gave the task of preparing a suitable city map based on L'Enfant's plan. Using his notes and those of Banneker, as well as pulling much from memory, Ellicott produced two maps, which became the version of L'Enfant's plan followed by later designers. As for L'Enfant, he died penniless and alone on June 14, 1825 and was buried at a farm of a friend in Maryland. In 1889, L'Enfant's plans were rediscovered in the archives

and in 1901 the design of the capital was developed along the lines he had laid down. Eight years later his genius was finally honored when he was reinterred in Arlington National Cemetery, with a ceremony held at the capital rotunda and a monument erected at his grave.

Banneker spent his last years as an internationally known polymath. He published a treatise on bees, did a mathematical study of the cycle of the seventeen-year locust, and became a pamphleteer for the anti-slavery movement. Banneker continued scientific studies by night and worked his farm by day. He hosted many distinguished scientists and artists at his home. On his birthday in 1806 after a walk with a friend, he complained of being ill. He went home to rest on his couch and later in the day, “the first Negro Man of Science,” as he was often referred to, died at age 74. Public schools both in Baltimore and Washington, D.C. have been named to honor him. The Benjamin Banneker Association was established to enrich the lives of African-American children with mathematical experiences in order to encourage their success with the study of mathematics.

**Quotation of the Day:** “The color of the skin is in no way connected with strength of the mind or intellectual powers.” – Benjamin Banneker