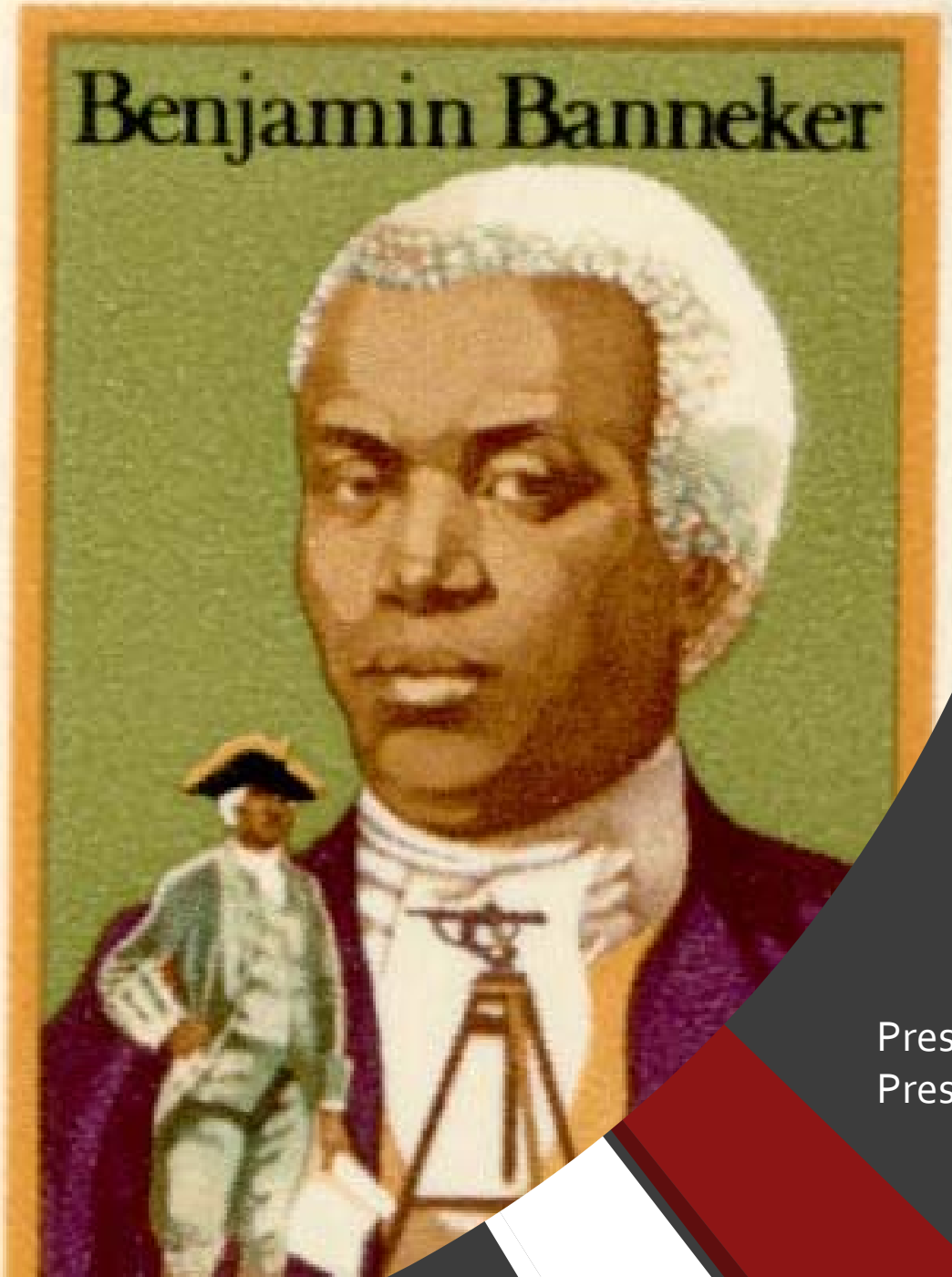


Building Like Banneker

Using History and Culturally Responsive Pedagogy to Shape Positive Mathematics Identities

Presenter, Brea Ratliff
President, Benjamin Banneker Association, Inc.

https://bbamath.org

Who We Are

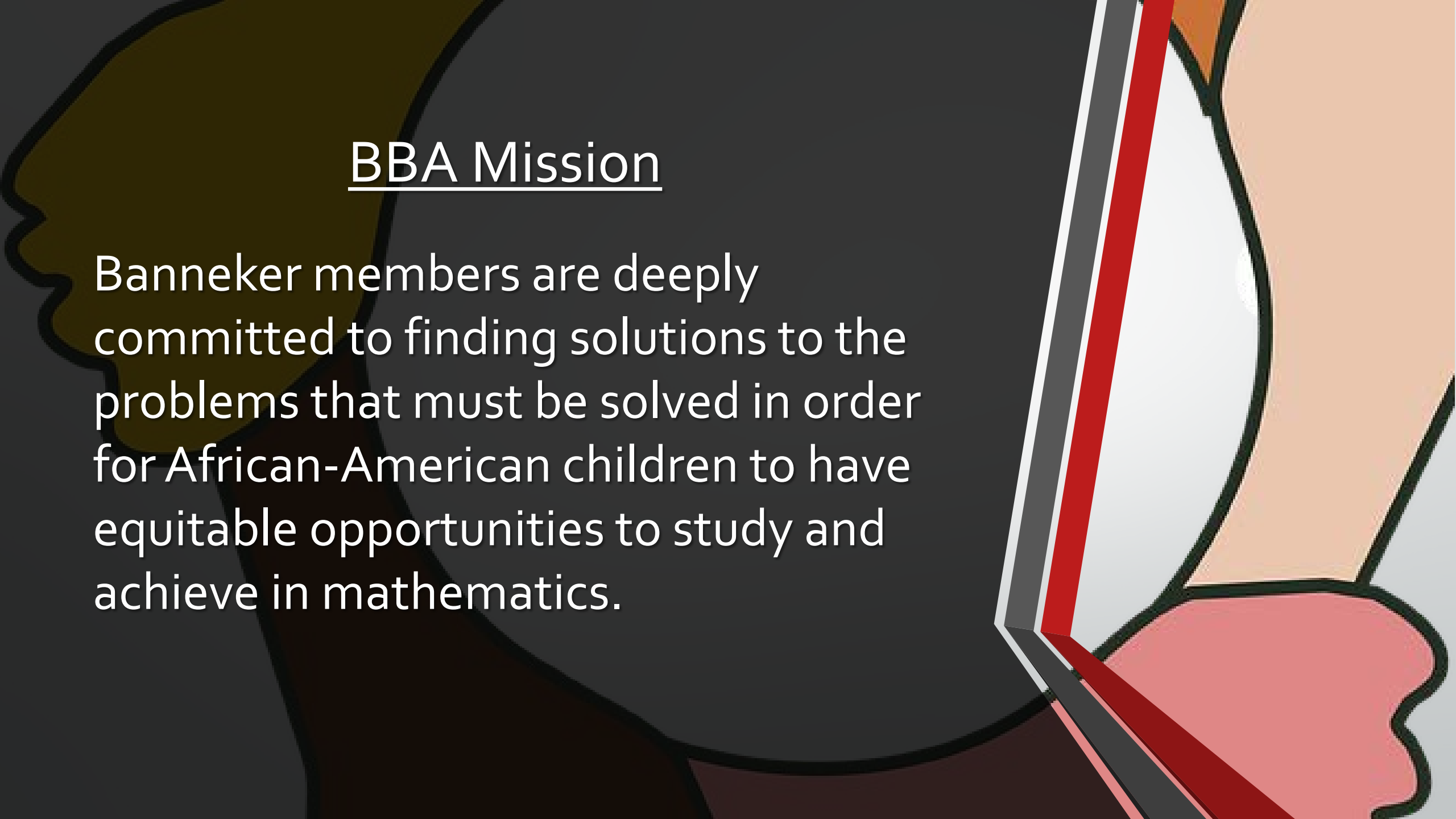
The Benjamin Banneker Association (BBA) has long been an advocate for parity in the education of African-American children.

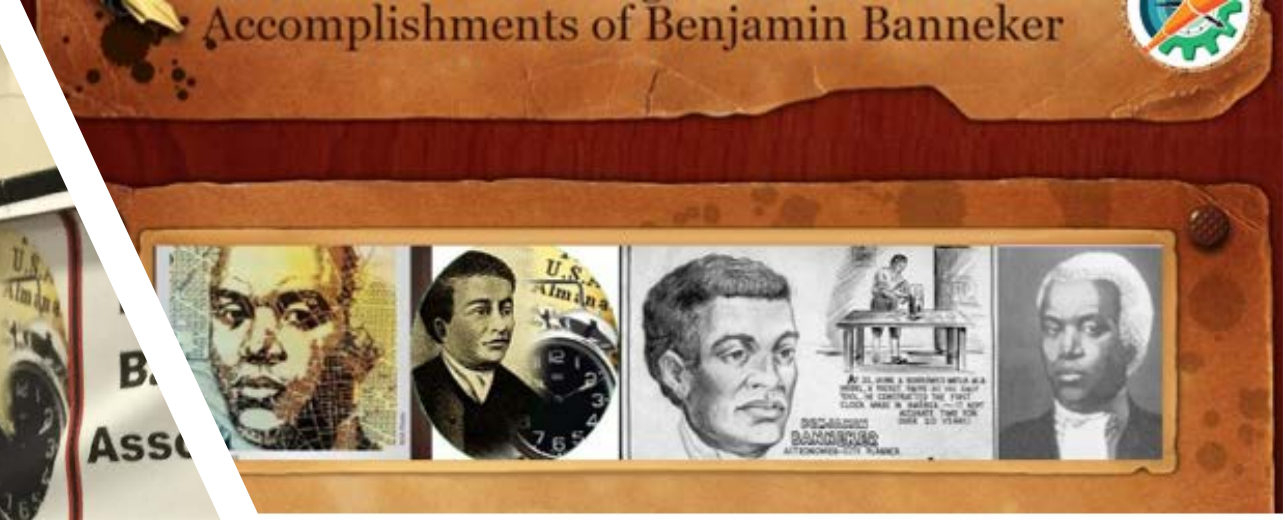
BBA Vision

All children – particularly students of African ancestry – have access to the highest quality mathematics education that empowers them to gain the self-confidence, enthusiasm, and endurance needed to succeed in mathematics and to transform themselves and their communities.

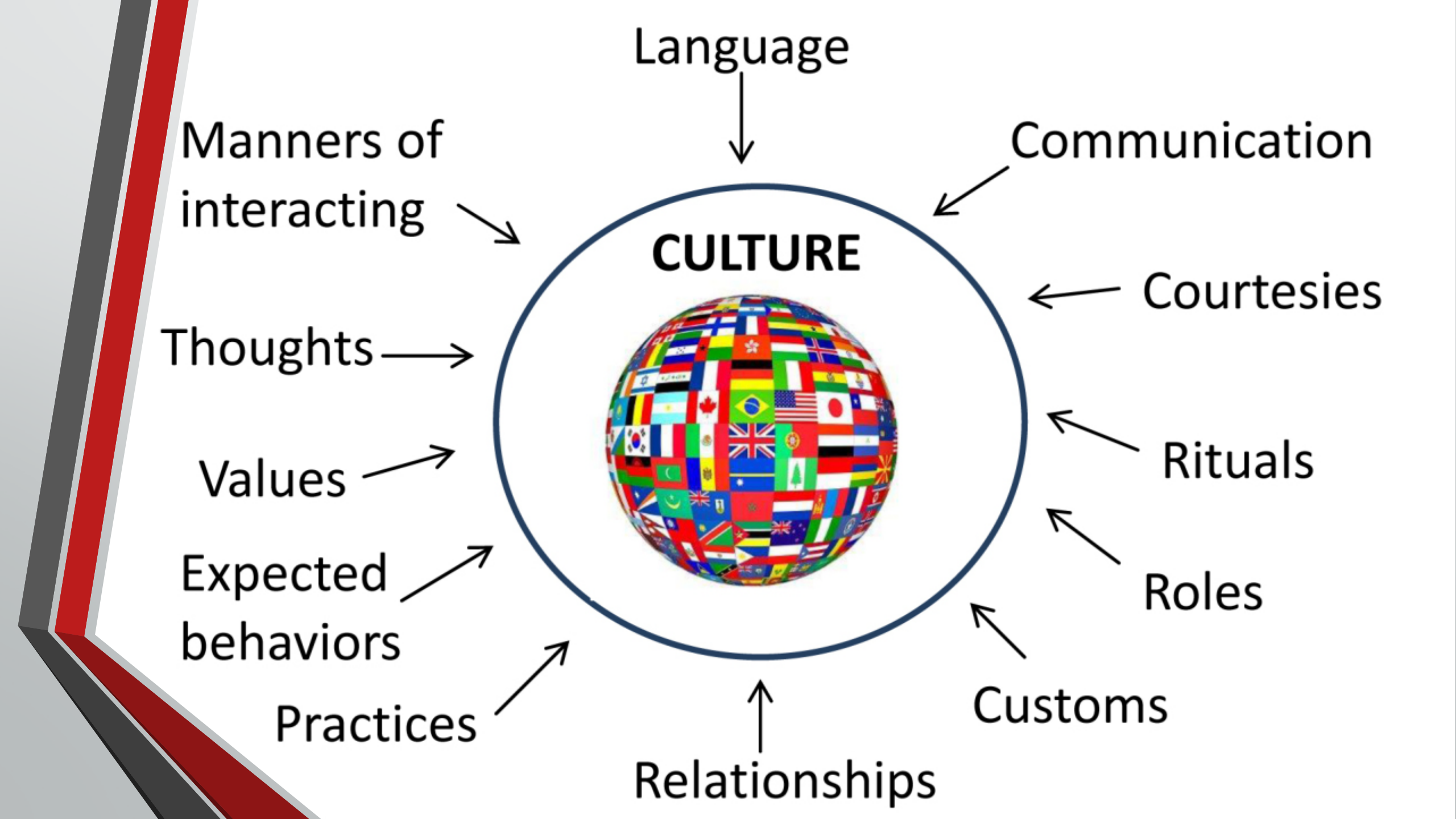
BBA Mission

Banneker members are deeply committed to finding solutions to the problems that must be solved in order for African-American children to have equitable opportunities to study and achieve in mathematics.





in Banneker Inspired Lessons


Language
Manners of interacting
Communication
CULTURE
Courtesies
Thoughts
Rituals
Values
Expected behaviors
Roles
Practices
Customs
Relationships

Impact of Culture on Social Inequity

Cultural Impact: Stereotypes

- What is a stereotype and how do they come to exist?
- What are some of the commonly held beliefs you have about people from the other groups?

Cultural Impact: Prejudice

- What is prejudice?
- How would you define the relationship between stereotypes and prejudice?

Cultural Impact: Discrimination

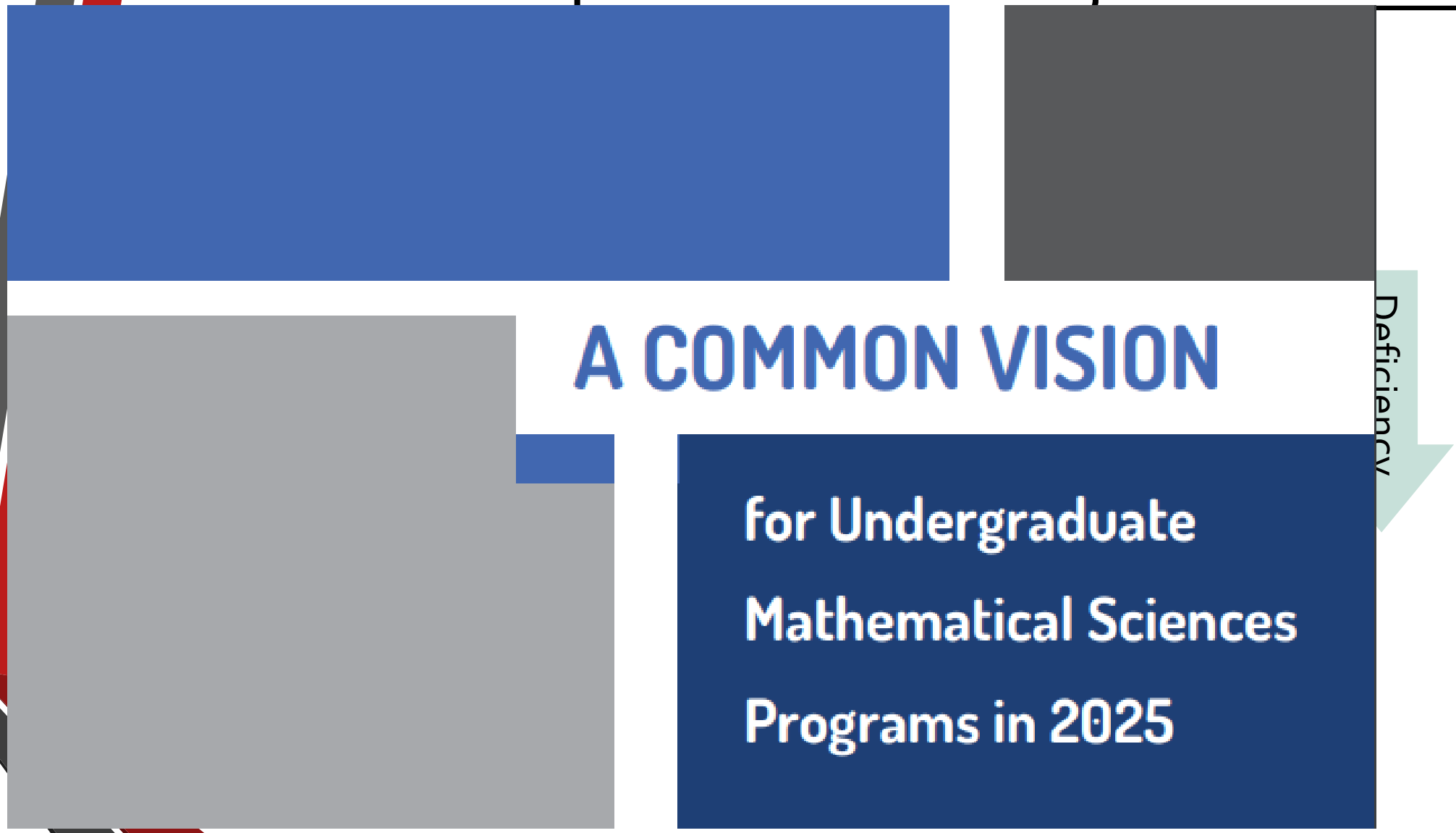
- What is discrimination?
- How would you define the relationship between discrimination, prejudice and stereotypes?

Where have we seen these cultural impact in the teaching and learning of mathematics?

- Stereotypes
- Prejudice
- Discrimination


BLACK
HISTORY
MONTH

Cultural Impact on Teaching and Learning



Multicultural Mathematics Disposition (MCMD) Framework

Dispositional Factors

- Openness
- Self-Awareness / Self-Reflectiveness
- Commitment to Culturally Relevant Mathematics Teaching

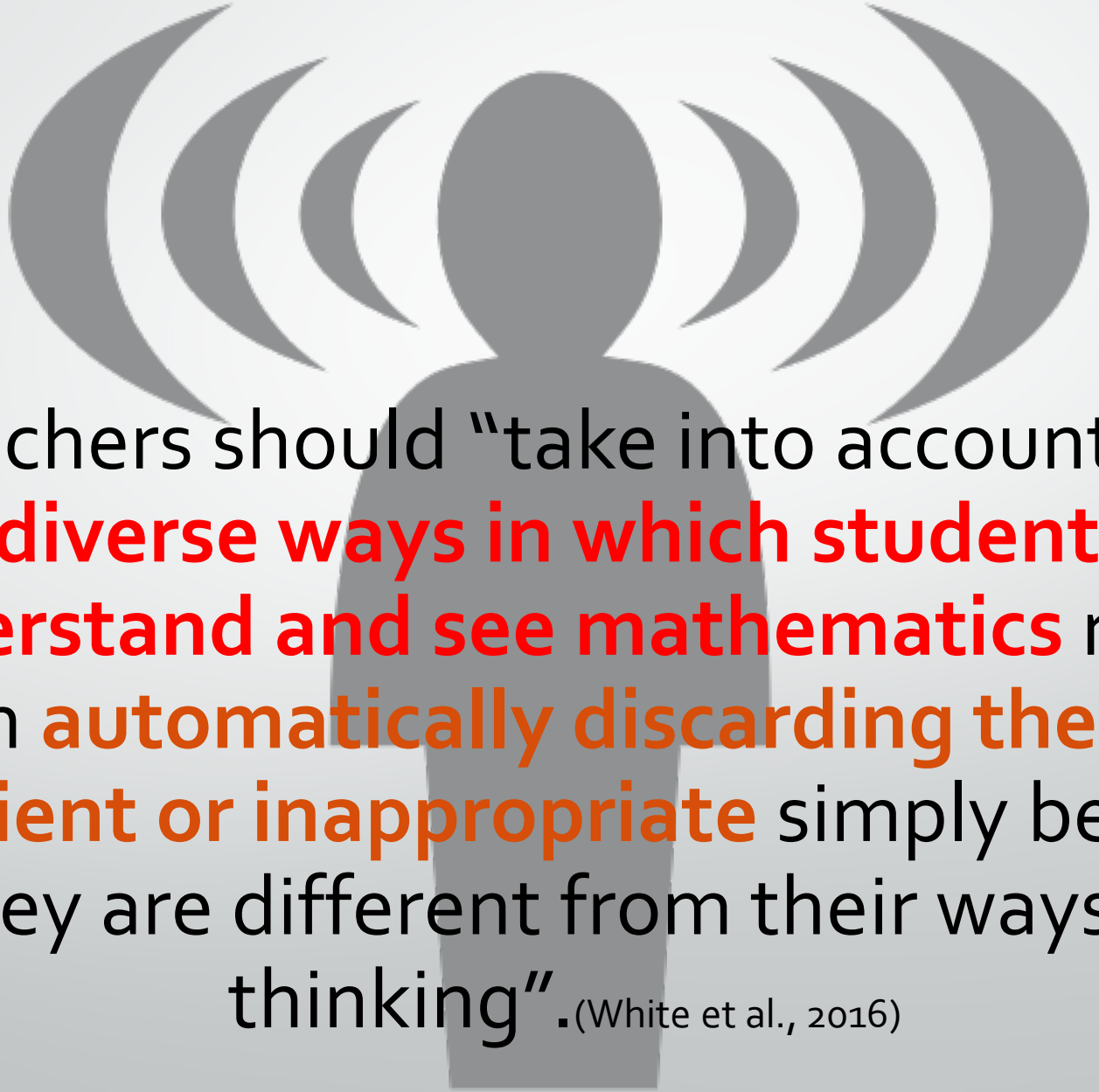
(White, DuCloux, Carreras-Jusino, Gonzalez, & Keels, 2016)

"…MCMD should encourage mathematics teachers to see mathematics as a cultural activity and their role as a mediator between students' culture and mathematical learning."

(White et al., 2012)

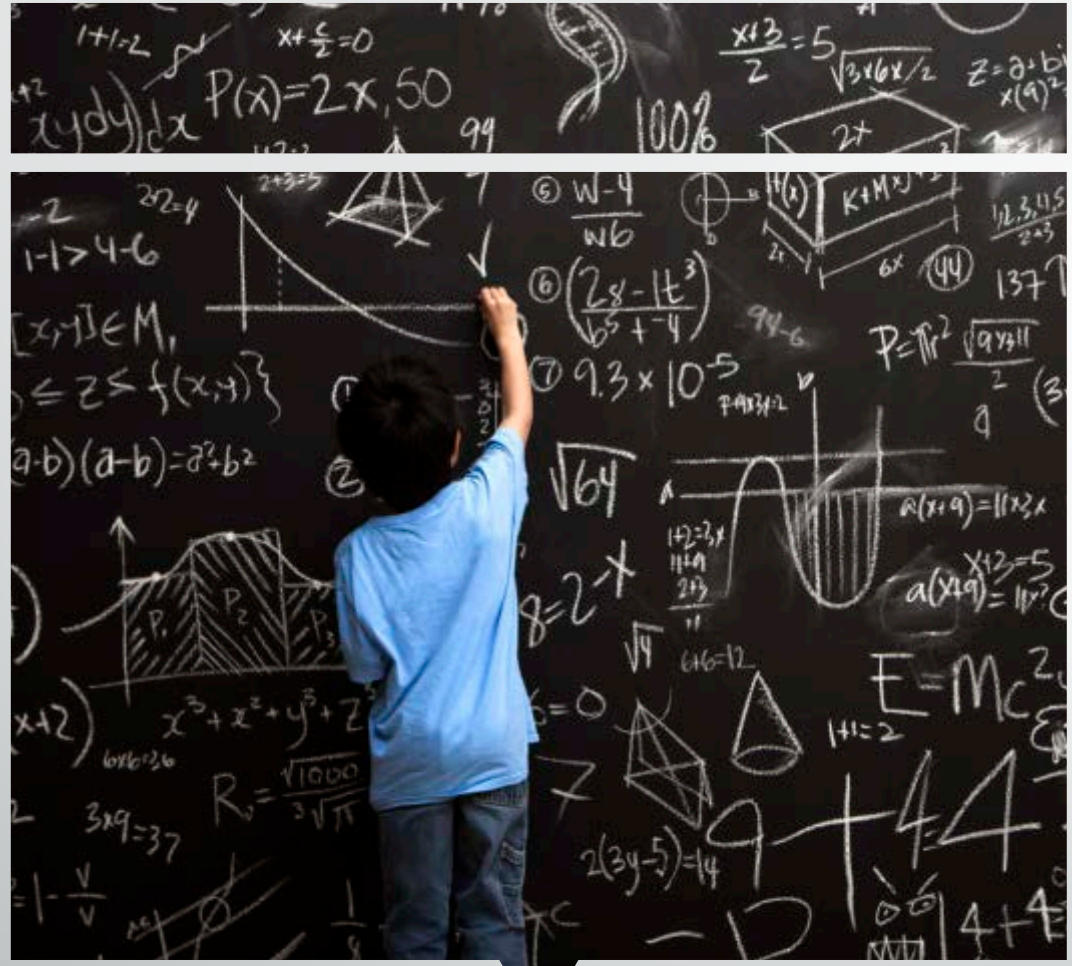
We are advocates and mediators.

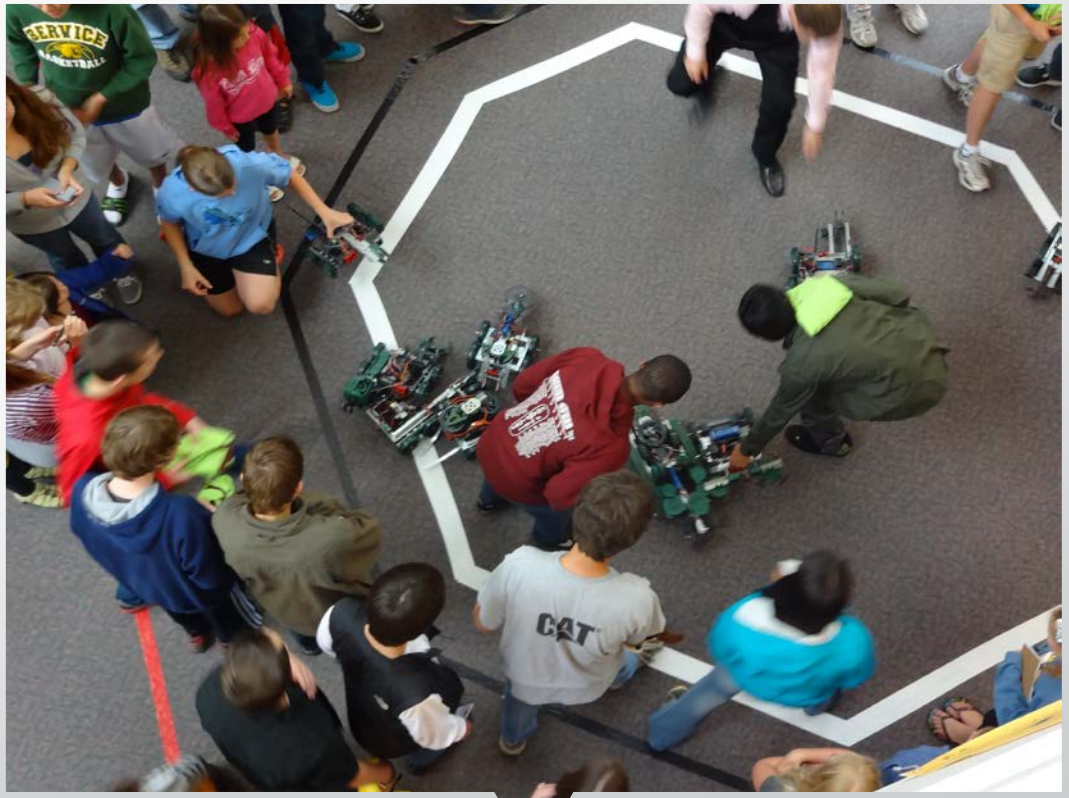
Openness



Teachers should "take into account the **diverse ways in which students understand and see mathematics** rather than **automatically discarding them as deficient or inappropriate** simply because they are different from their ways of thinking".(White et al., 2016)

Openness





How do you and your students think about and "do" mathematics?

Doing mathematics

- Worthwhile tasks
- Students take risks, share and defend ideas
- Engaged in problem solving
- Questions encourage students to make connections and understand the math they are exploring

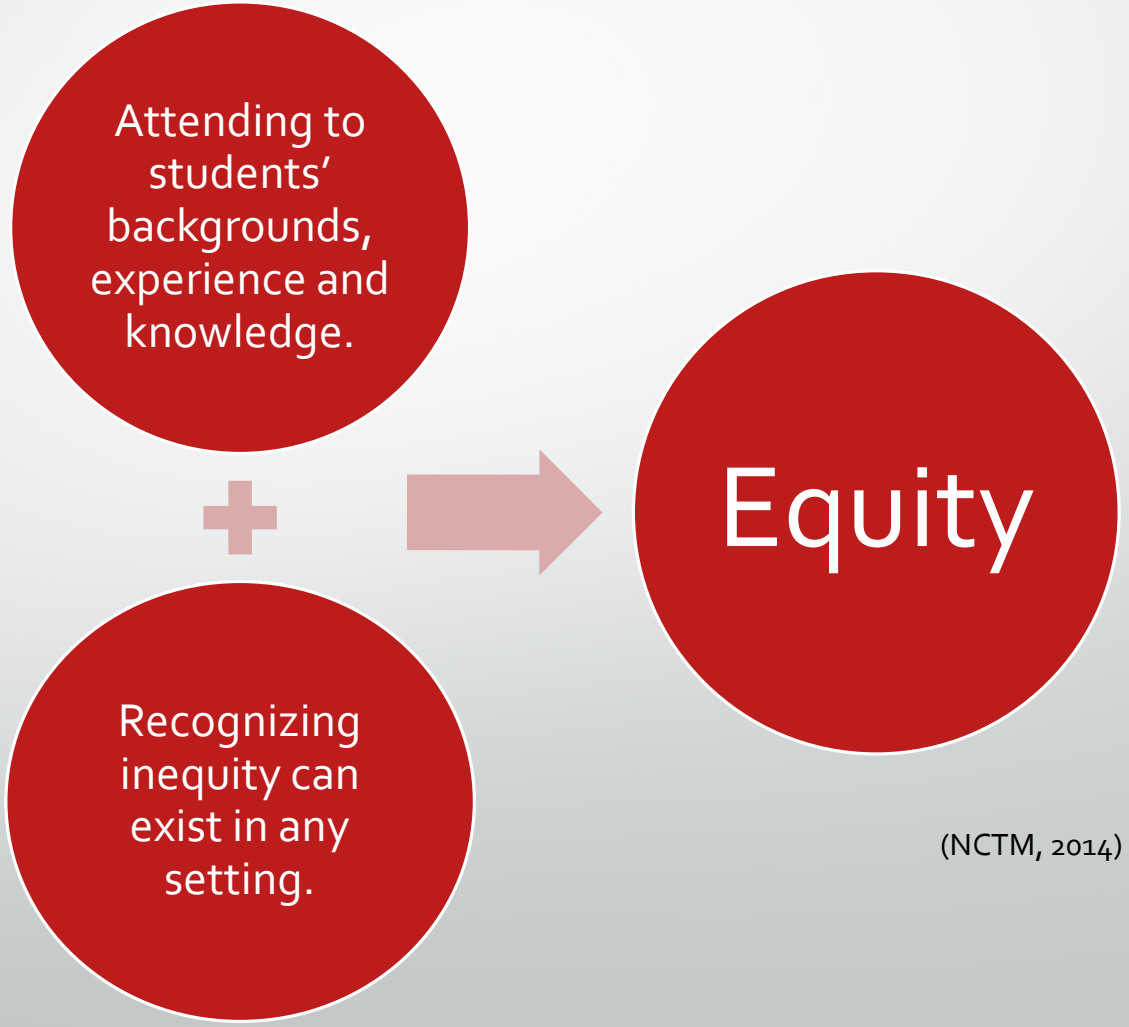
(Van De Walle et al., 2013)

Self-Awareness / Self-Reflectiveness

- What prejudices do I have that impact my teaching and learning of mathematics?
- Am I enacting discriminatory practices towards others in the mathematics classroom and/or in professional settings?

Commitment to Culturally Relevant Mathematics Teaching

Maintaining High Standards



(NCTM, 2014)

9 Equitable Mathematics Teaching Practices

- Draw on student's funds of knowledge
- Establish classroom norms for participation
- Position students as capable
- Monitor how students position each other
- Attend explicitly to race and culture
- Recognize multiple forms of discourse and language as a resource
- Press for academic success
- Attend to students' mathematical thinking
- Support development of a sociopolitical disposition

(Bartell, Wager, Edwards, Battey, Foote, Spencer, 2017)

A gentleman Sent his Servant with £100 to buy 100 Cattle, with orders to give £5 for each Bullock, 20 Shillings for cows, and one Shilling for each Sheep, the question is to know what number of each sort he brought to his master.

Divide 60 into four Such parts that the first being increased by 4, the Second decreased by 4, the third multiplied by 4, the fourth part divided by 4, that the Sum, the difference, the product, and the Quotient shall be one and the Same number.

Suppose ladder 60 feet long be placed in a Street so as to reach a window on one Side 37 feet high, and without moving it at bottom, will reach another window on the other side of the Street which is 23 feet high, required the breadth of the Street.

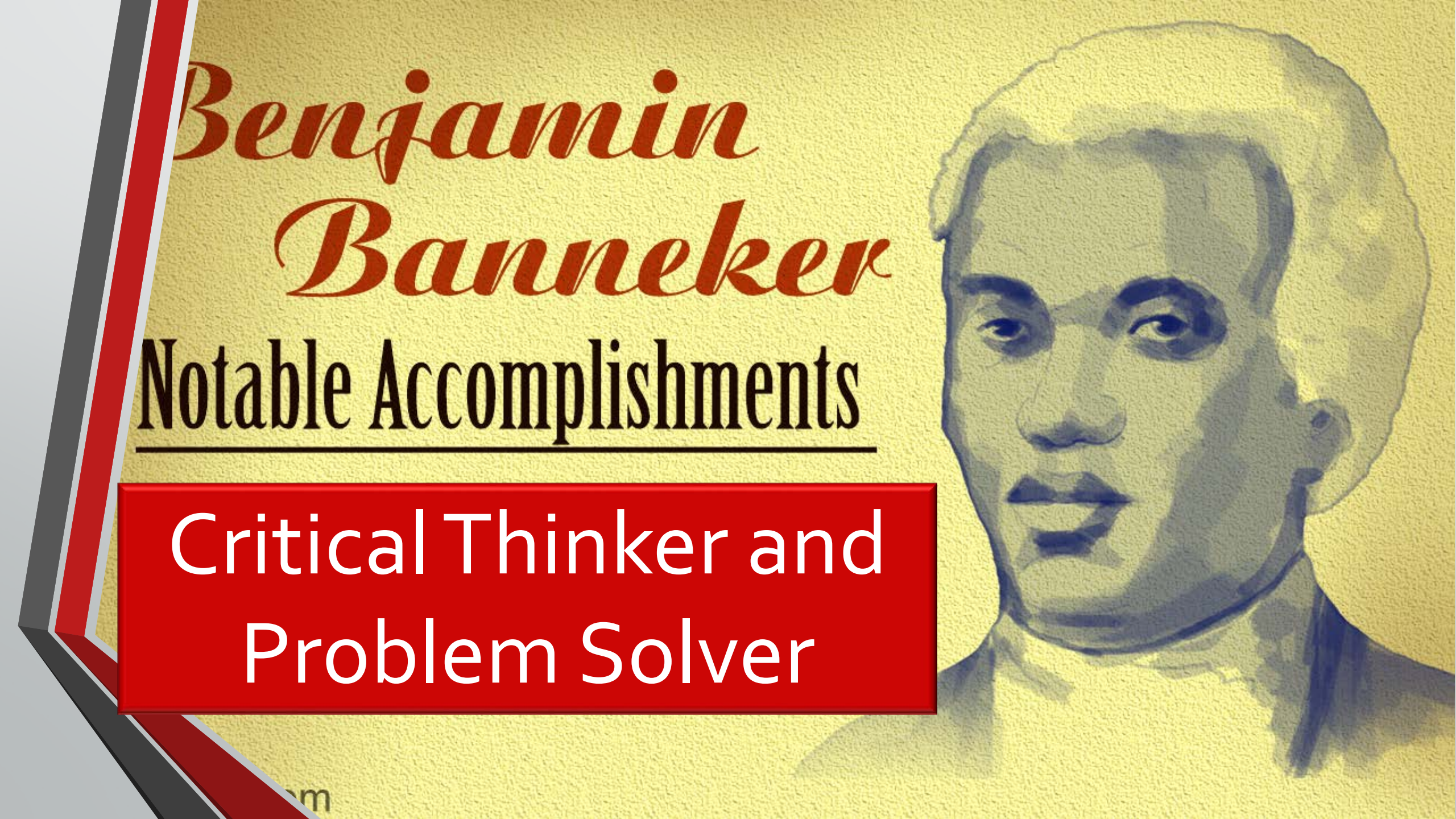
Personal Reflections

What did you learn?

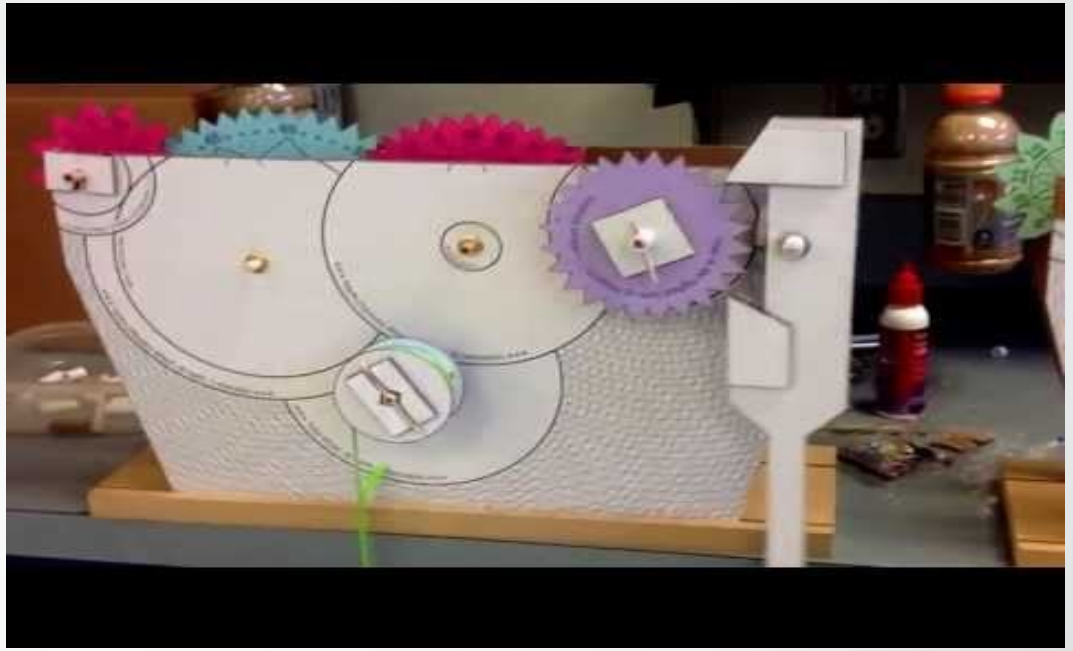
Benjamin Banneker

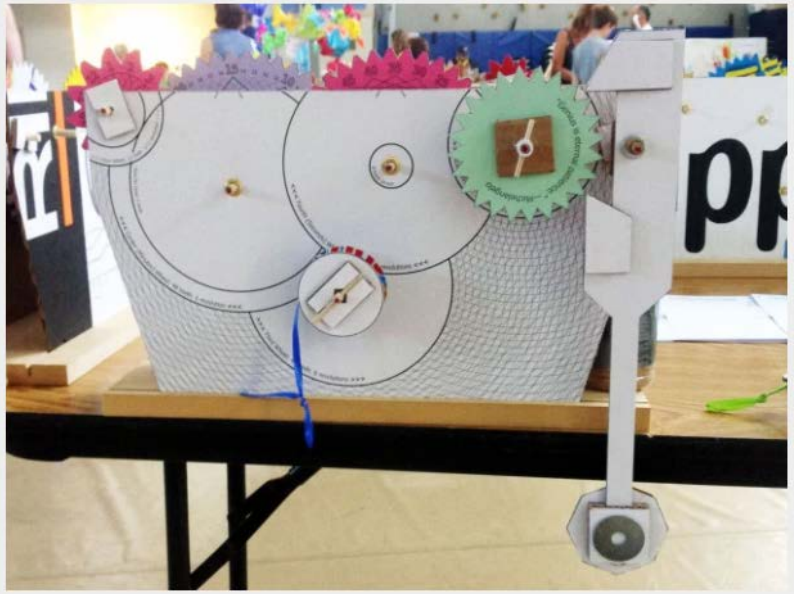
"The First African American Man of Science"

"The Man Who Loved The Stars"


Benjamin
Banneker
Notable Accomplishments
Critical Thinker and
Problem Solver

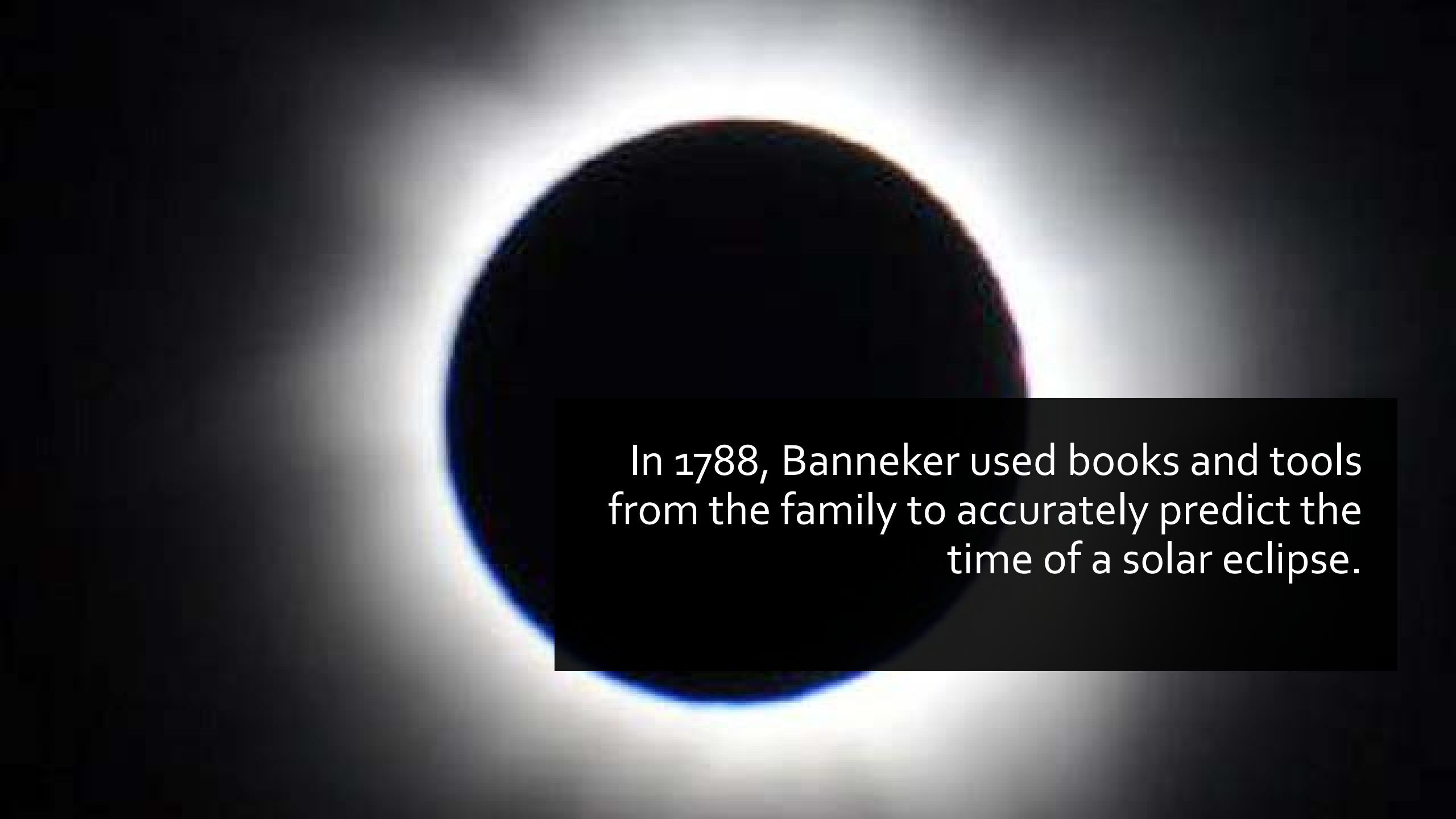
Thinking and Tinkering



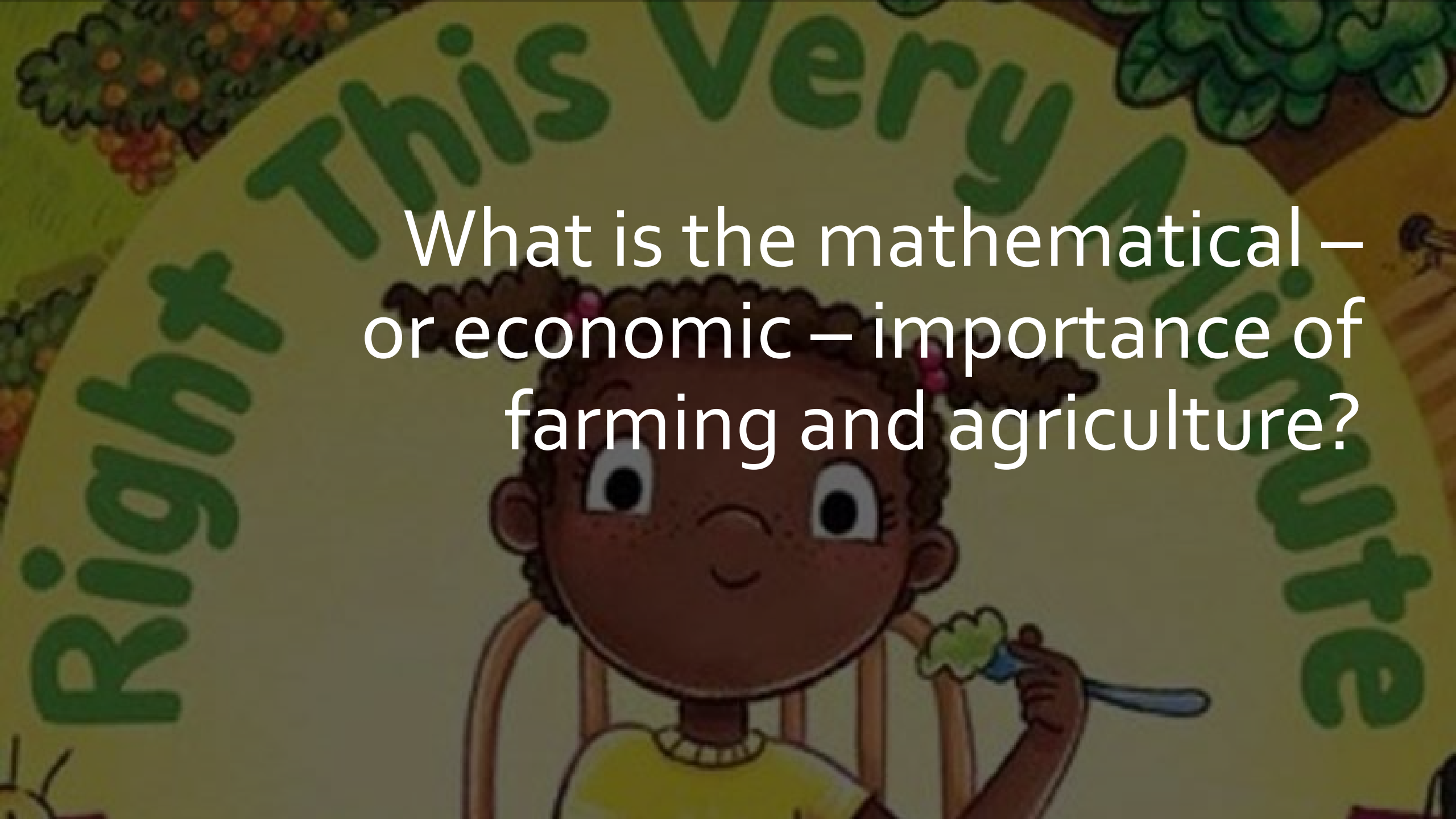


The escape wheel reads: "Genius is eternal patience." – Michelangelo


How do we predict our weather?



In 1788, Banneker used books and tools from the family to accurately predict the time of a solar eclipse.

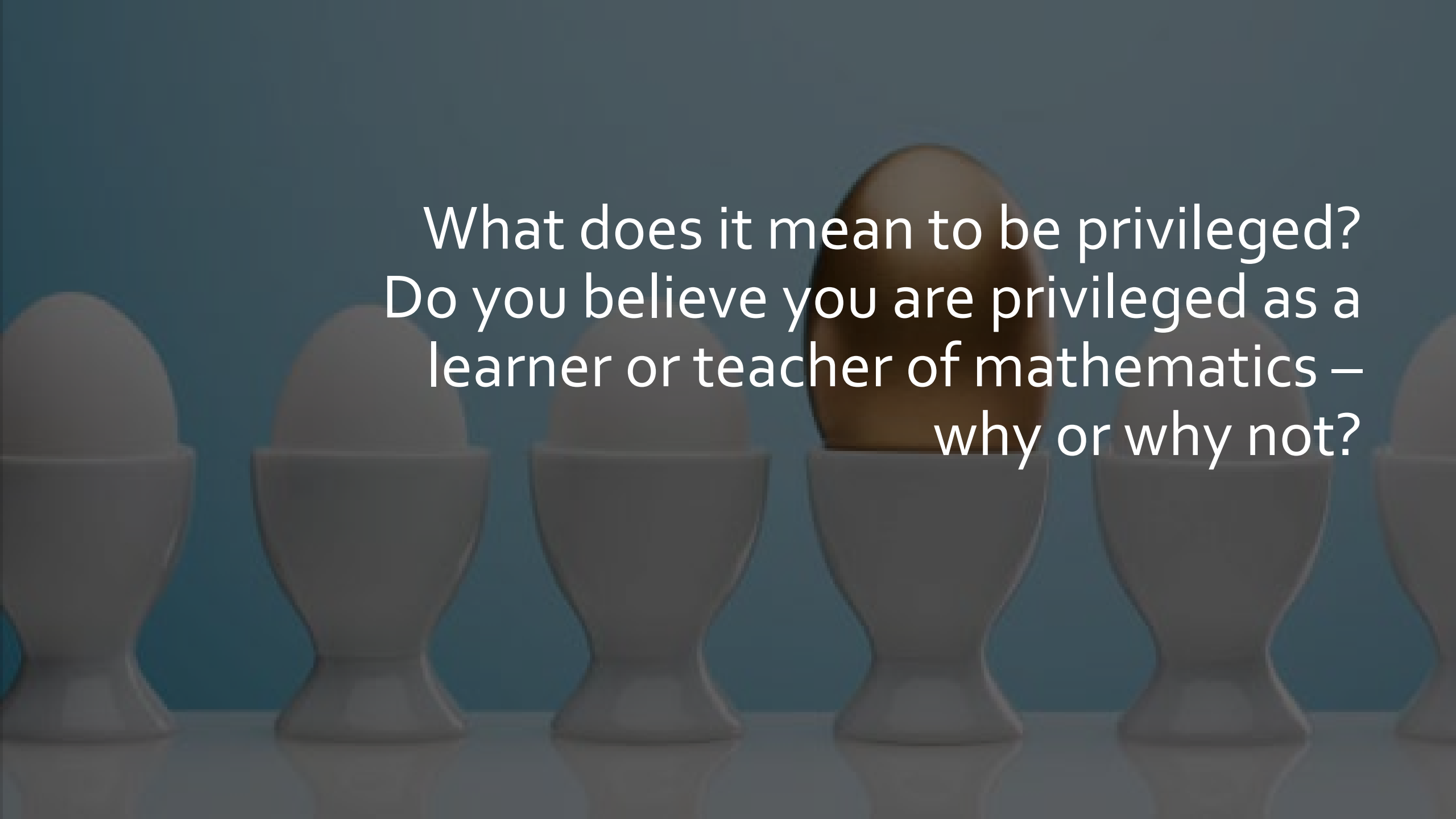


What is the mathematical – or economic – importance of farming and agriculture?


Kitchen's Open

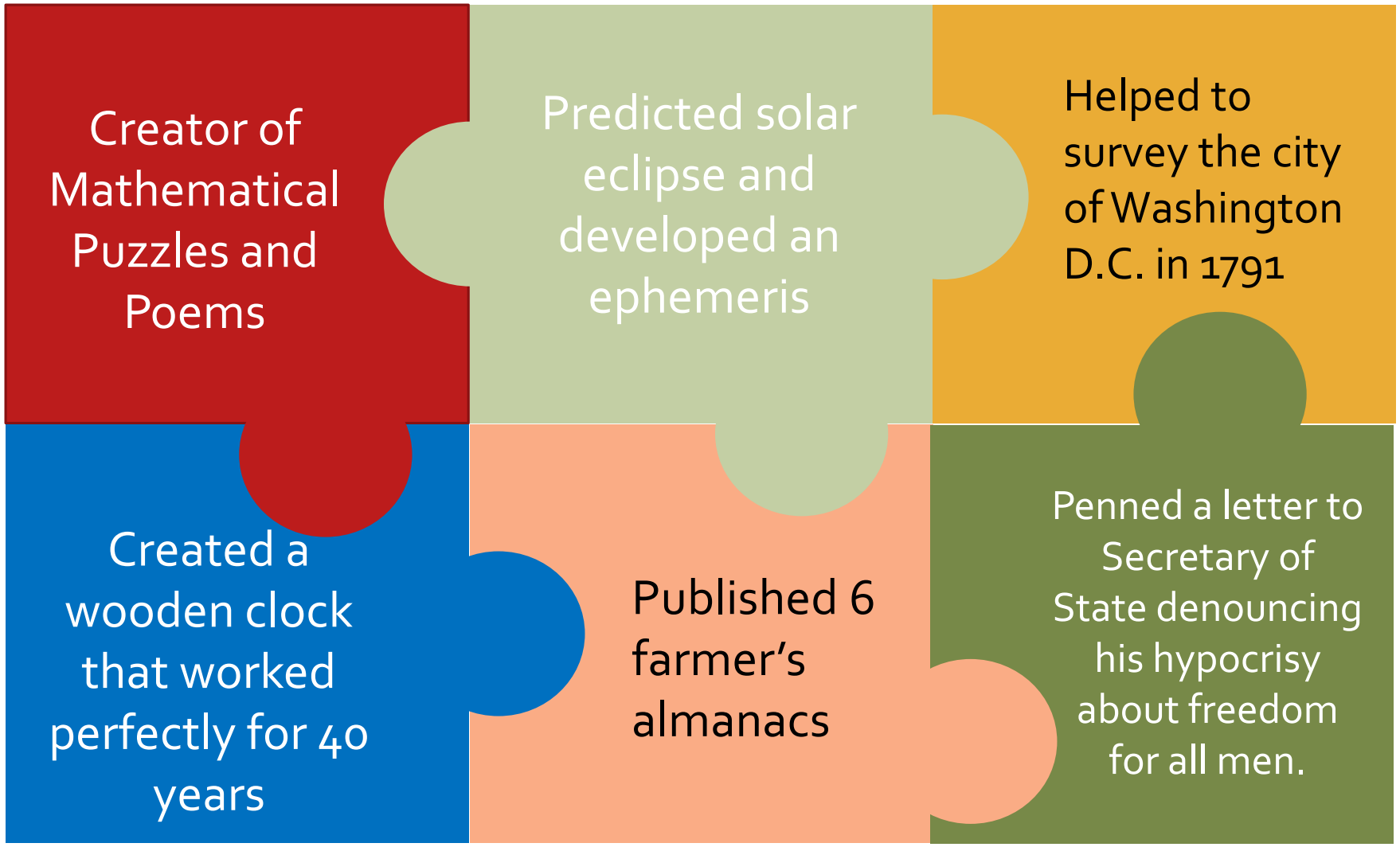
What mathematics is involved in surveying?


MDCCC.
Lat. Capitol. 38.53. N.
Long. 0. 0.
GEORGE TOWN.
PART OF VIRGINIA WITHIN THE TERRITORY OF COLUMBIA
POTOMAK RIVER.
EASTERN BRANCH.
MARYLAND WITHIN THE TERRITORY OF COLUMBIA
Observations
explanatory of the Plan.
Breadth of the Streets.



What does it mean to be privileged? Do you believe you are privileged as a learner or teacher of mathematics – why or why not?

Letter from Benjamin Banneker to Thomas Jefferson


Creator of Mathematical Puzzles and Poems
Predicted solar eclipse and developed an ephemeris
Helped to survey the city of Washington D.C. in 1791
Created a wooden clock that worked perfectly for 40 years
Published 6 farmer's almanacs
Penned a letter to Secretary of State denouncing his hypocrisy about freedom for all men.

The Spirit of Benjamin Banneker

- What problems need solving?
- What interests them?
- How can they be encouraged to use mathematics to authentically solve these problems?

"Building like Banneker" means understanding mathematics is a language, an art, a way of life, and a tool for social justice; a versatile medium for describing and contributing to the world.

~B. Ratliff

Visit our table to learn more about the Benjamin Banneker Association and the "Build Like Banneker" competition!

- Website: https://bbamath.org
- Facebook and Twitter: @bbamath

Citations

- Bartell, T., Wager, A., Edwards, A., Battey, D., Foote, M., & Spencer, J. (2017). Toward a framework for research linking equitable teaching with the standards for mathematical practice. *Journal for Research in Mathematics Education*, *48*(1), 7-21.
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- National Council of Teachers of Mathematics (NCTM). (2014). Principles to actions: Ensuring mathematical success for all.
- White, D. Y., DuCloux, K. K., Carreras-Jusino, Á. M., González, D. A., & Keels, K. (2016). Preparing preservice teachers for diverse mathematics classrooms through a cultural awareness unit. Mathematics Teacher Educator, 4(2), 164-187.
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