Build Like Benjamin Banneker

A 2022-2023 Global Cardboard Challenge Event

Use cardboard to construct your own invention like Benjamin Banneker!

A Brief History of Benjamin Banneker

Born on November 9, 1731, outside Baltimore, Maryland, Benjamin Banneker was an extraordinary, self-educated, free African American. His zest for knowledge led him to become an accomplished mathematician, abolitionist, and surveyor of our nation’s capital. When Banneker was not star gazing, you could find him maintaining his one-hundred-acre tobacco farm, orchard, and apiary. Today his property serves as the location of the Benjamin Banneker Historical Park and Museum, part of the Baltimore County Department of Recreation and Parks.

“About Benjamin Banneker”. Authored by the Benjamin Banneker Foundation, Inc. (www.bannekerfoundation.com)

This challenge is a cross-curricular activity addressing mathematics, science, history/social studies, language arts, reading, and the arts!
The Benjamin Banneker Association, Inc. (BBA) is an advocacy organization which supports high-quality learning in mathematics by converging these three ideas:

Focus  
Perseverance  
Inspiration

We hope Benjamin Banneker’s exceptional focus and perseverance will also inspire your inventiveness and desire to exercise your creative talents through the “Build Like Benjamin Banneker” Cardboard Challenge.

Why the cardboard challenge?

- Cardboard is a strong and lightweight material made up of the same resource Benjamin Banneker used over 250 years ago – wood! Corrugated cardboard is manufactured from pine chips and often used as building material. (Advameg, 2017).
- Building cardboard models promotes creativity, ingenuity, resourcefulness, perseverance, and teamwork (Cherry Creek Schools Foundation, 2014).
- Provides individuals with an opportunity to explore their interests and passions and create things that positively impacts others.
- Most of all - it is fun and challenging!

Clock created by student at Knox Gifted Academy in Arizona  
image taken from https://www.flickr.com/photos/buistbunch/21114218824/

Cardboard is being considered as a building material because it is “inexpensive, environmentally friendly, and cheap to manufacture” (Rose, 2012).
- For a more in-depth look at how cardboard can be used for major constructions, check out this presentation on Cardboard as a Building Material.
Instructions

1. **Learn About Benjamin Banneker:** After studying the life of Benjamin Banneker and his many inventions, design your own using cardboard as the primary material. Your invention should:
   a. reflect the resourcefulness and imagination of Benjamin Banneker
   b. provide purpose for / impact your community (school, neighborhood, city, etc.)
2. **Design Your Invention:** A design blueprint must be drawn on graph paper before any cardboard construction begins.
3. **Time to Build!** Build your structure using cardboard and other approved building materials (see list below).
4. **Show the World Your Masterpiece!** Take pictures of your completed structure. Make a short video (less than 5 minutes) showing how it was constructed, and how it works.

Approved Building Materials

The following materials approved for this project include **(but are not limited to):**

- measuring tools (such as ruler, measuring tape, meter / yard sticks, protractor, or a compass)
- paper
- tape
- glue
- brads
- scissors
- pencils
- re-used / empty containers (such as plastic bottles milk cartons, egg cartons, paper towel, toilet paper tubes, stuffed animals)
- clock movement kit / parts from a working clock (which can be purchased from Hobby Lobby, Michaels, Amazon, etc.)
- art supplies (such as markers, paint and confetti to decorate your invention)
- lenses (for a telescope)

The primary material used in any invention submitted for this competition must be **cardboard!**

Competition Guidelines

1. There are **5 competition categories:**
   - Pre-school (ages 2 – 4);
   - Elementary (students in Kindergarten – Grade 5);
   - Middle (students in grades 6 – 8);
   - High School (students in grades 9 – 12); and
   - Adults (ages 18+)
2. You may work alone, with a partner, or in a group. Invite friends, family, classmates, and community members to help!
3. **Elementary – Adult Categories**: You must provide a written project reflection to accompany your invention that explains the **personal**, **civic**, **scientific**, and **mathematical** significance of what you’ve built. For example:
   - How did Benjamin Banneker inspire your invention?
   - How does your invention help or impact your community, our country or the world?
   - What did you learn while creating this invention?
   - Benjamin Banneker persisted in developing his inventions. Sometimes taking years to create one invention. How did you persist while creating your invention?

4. Inventions will be evaluated by the following criteria:
   - Creativity and originality of concept
   - Design blueprint
   - Long-term stability *(Benjamin Banneker’s clock ran for over 40 years!)*
   - Use of cardboard as a primary material
   - Project reflection

**Registration Information**

To register for the Build Like Banneker Challenge, complete the [online registration form](#).

**Submission Information**

- Your submission packet should be emailed to Brea Ratliff ([brearatliff@gmail.com](mailto:brearatliff@gmail.com)) no later than **January 31, 2023**. The following materials **must** be included in your submission packet:
  - Project reflection
  - Registration Form (please submit one form per individual)
  - Copy of the design blueprint
  - Pictures of final structure
  - Link to video showing the structure in use
- Submissions will be accepted via email only.

**Awards**

The top participants in each category will be featured in national BBA publications, including our website, newsletter, as well as our journal, *The Lighthouse Almanac*.

Special prizes will be awarded to the **1st**, **2nd**, and **3rd** place participants in each category.
What Can I Build?

You can build anything!

We want you to be inspired by Benjamin Banneker, who was a mathematician, astronomer, author, abolitionist, surveyor, and farmer. Mr. Banneker, often recognized as the first African-American Man of Science, was a creative problem solver. Through this challenge, we hope you use and continue to increase your own innovative abilities!

Here are a few examples of things you could build - or build upon – as well as some content connections:

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Recommended Resources

These resources will help you learn more about Benjamin Banneker and other cardboard creations:

Books

- **Tick Tock, Banneker’s Clock** by Shana Keller
- **Dear Benjamin Banneker** by Andrea Davis Pinkney
- **Hand in Hand: Ten Black Men Who Changed America** by Andrea Davis Pinkney
- **The Life of Benjamin Banneker: The First African American Man of Science** by Silvio A. Bedini

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Websites

- The Benjamin Banneker Association (www.bbamath.org)
- The Benjamin Banneker Foundation (www.bannekerfoundation.com)
- Mathematicians of the African Diaspora (http://www.math.buffalo.edu/mad/special/banneker-benjamin.html)
- PBS Africans in America: Benjamin Banneker (https://www.pbs.org/wgbh/aia/part2/2p84.html)
- Agriculture, Food and Natural Resources Integrated Projects (http://www.stemtransitions.org/ag.php)

Cardboard Creations

- Cereal Box Clock (https://youtu.be/45-M1g6lef4) and PDF gear patterns (http://bit.ly/ng-cereal-clock)
- Homemade Telescope (https://www.savvyhomemade.com/building-a-homemade-telescope/)
- Cardboard Gardening Containers (http://www.birdsandblooms.com/gardening/gardening-basics/cardboard-gardening/)
- Global Cardboard Challenge (https://cardboardchallenge.com/events/ - type “Banneker” in the search bar and select the event ending on 1/31/2023)

Special Thanks

The Benjamin Banneker Association would like to thank the following individuals and groups for their contribution to our Benjamin Banneker Celebration and Challenge:

- Dr. Vanessa Cleaver, Past President of the Benjamin Banneker Association (BBA); creator of BBA’s Benjamin Banneker Week Celebration.
- Natalie Holliman, first chairperson and organizer of BBA’s Benjamin Banneker Week Celebration
- Brea Ratliff, BBA President; creator of the “Build Like Banneker Challenge”
- The Benjamin Banneker Foundation, Inc.
- The Benjamin Banneker Historical Park and Museum
“Build Like Banneker” Submission Form

Participant Name(s) ____________________________________________________________

Email Address _________________________________________________________________

Category (circle one): Pre-school      Elementary      Middle      High School      Adult

Type of Invention _______________________________________________________________

☐ I give my permission to allow my photograph to be used on the Global Cardboard Challenge website, and in Benjamin Banneker Association, Inc. publications.

☐ I give my permission to be interviewed for Benjamin Banneker Association, Inc. publications.

__________________________________________       _______________________________________
Participant Signature                        Parent/Guardian/Sponsor Signature

(for children under the age of 18)

I confirm this submission contains my / my child’s original design and work and I understand that all judges’ decisions are final.

__________________________________________       _______________________________________
Participant Signature                        Parent/Guardian/Sponsor Signature

(for children under the age of 18)

Please email this form and your submission packet to Brea Ratliff (brearatliff@gmail.com) no later than January 31, 2023.
References


