

Flags of Africa: Promoting Cultures & Connecting Math Concepts

https://digitalcommons.imsa.edu/pfs_pr/49/

Presented By:

Kelly Wamser Remijan, PhD

PD/Curriculum Specialist, Illinois Mathematics & Science Academy (IMSA) – Center for Teaching & Learning
Director-at-Large, Illinois Council of Teachers of Mathematics (ICTM)

Email: kremijan@imsa.edu LinkedIn: <https://www.linkedin.com/in/kellyremijan/> Twitter: @Teachers4STEAM

****After attending this session, I would greatly appreciate your feedback by completing a 2-minute survey. ☺**
www.tinyurl.com/IMSASurvey22

Objectives

- #1 - To share ideas for using flags of Africa and technology to engage students with math concepts: counting, fractions, percentage, aspect ratio, linear equations/inequalities, domain/range, angles/distances/slope, classifying triangles, area of polygons, slope, parallelograms, & coordinate geometry.
- #2 – To highlight technology such as Google Slides, Google Sheets Pixel Art, GeoGebra, Desmos, and CNC Machines that help enrich the teaching of math concepts.
- #3 - To provide ideas for promoting discussion of culture, history, & geography within the math classroom.

Nigeria

- Create the flag by hand on grid paper (Grid Paper Resource: <https://incompetech.com/graphpaper/plain/>)
- Create the flag using GEOMETRY with Google Slides
 - https://docs.google.com/presentation/d/1LXw_0OgfKfvYld31IdT8Fshyq_O2Pr6D9KWLj-EjEo/copy
- Create the flag using ALGEBRA (linear equations /inequalities) w/ www.Desmos.com
 - Remijan, K. (2021). Flag Designs of African Countries: Enriching the Graphing of Linear Equations and Inequalities in Algebra. **The Lighthouse Almanac**. 12-19. http://bbamath.org/wp-content/uploads/2021/03/Lighthouse-Almanac_Vol4_Issue1.pdf
 - Remijan, K. (2020). Day 11 - Travel the World Through Flags: Desmos, Equations, and Inequalities (2020). 19-19-19 COVIDeos 19 E-Learning Webinars. 11. Retrieved from https://digitalcommons.imsa.edu/covideos_19_webinars/11
- Discuss the history, geography, & culture of the country
 - Designed by a student & w/ green connected to agriculture - <https://www.britannica.com/topic/flag-of-Nigeria>
 - 500 Ethnic groups with 500 languages - <https://www.worldatlas.com/articles/largest-ethnic-groups-in-nigeria.html>
 - Nollywood - <https://www.studiobinder.com/blog/what-is-nollywood>

Guinea

- Create the flag using GEOMETRY (squares/rectangles) on grid paper or with Google Sheets Pixel Art using the concepts of aspect ratio with connections to area, perimeter, fractions, percentages, etc.
 - https://www.controlaltachieve.com/2017/02/sheets-pixelart.html?fbclid=IwAR2V11G_aY_jX_9K5iCN8ox3X-I20QBrP9R-6igFC3KuBleGKmaTjyN-yhg
- Create the flag using ALGEBRA (linear equations /inequalities & domain/range) w/ www.GeoGebra.org
 - Remijan, K. (2020). Day 02 - Friday Night Fun with Flags: GeoGebra for Geometry and Graphing. 19-19-19 COVIDeos 19 E-Learning Webinars. 2. Retrieved from https://digitalcommons.imsa.edu/covideos_19_webinars/2
- Discuss that there are 24 ethnic groups w/ the largest being the Fulani @ 40% - <https://tinyurl.com/mr45a5w6>
 - Hair is an important part of culture
 - Fulani braids originate w/ the Fulani - <https://www.genescareer.edu/history-of-braids-more-than-just-a-hairstyle/>
 - Braid patterns in Africa indicated a person's tribe, age, marital status, wealth, power, social position, and religion. - <https://www.brighthubeducation.com/social-studies-help/121031-cultural-significance-of-hair-braiding-in-african-tribes/>
 - “The practice of braiding or grooming hair has always created a sense of community for women, it evolved from being a custom kept within family structures, to being a communal activity for women from different walks of life to connect.” - <https://tinyurl.com/4w65sbdn>

Flags of Africa: Promoting Cultures & Connecting Math Concepts

https://digitalcommons.imsa.edu/pfs_pr/49/

Presented By:

Kelly Wamser Remijan, PhD

PD/Curriculum Specialist, Illinois Mathematics & Science Academy (IMSA) – Center for Teaching & Learning
Director-at-Large, Illinois Council of Teachers of Mathematics (ICTM)

Email: kremijan@imsa.edu LinkedIn: <https://www.linkedin.com/in/kellyremijan/> Twitter: @Teachers4STEAM

Republic of the Congo

- Discuss Pan-African colors - https://en.wikipedia.org/wiki/Pan-African_colours
- Create the flag by hand on grid paper using diverse shapes (Grid Resource: <https://incompetech.com/graphpaper/plain/>)
- Create the flag using ALGEBRA (graphing of linear equations /inequalities) with www.GeoGebra.org
 - Remijan, K. (2020). Day 02 - Friday Night Fun with Flags: GeoGebra for Geometry and Graphing. 19-19-19 COVIDEOS 19 E-Learning Webinars. 2. Retrieved from https://digitalcommons.imsa.edu/covideos_19_webinars/2
- Re-imagine the flag using ALGEBRA (linear equations /inequalities) with www.Desmos.com
 - Remijan, K. (2021). Flag Designs of African Countries: Enriching the Graphing of Linear Equations and Inequalities in Algebra. **The Lighthouse Almanac**. 12-19. http://bbamath.org/wp-content/uploads/2021/03/Lighthouse-Almanac_Vol4_Issue1.pdf
- Explore the Geometry of flags without or with technology such as www.GeoGebra.org
 - Measure Angles/Distances to Classify Triangles & Measure Area of a Polygon to Make Conclusions
 - Measure Distance/Slope to prove that a quad is a Parallelogram

Somalia

- Discuss how the culture (geography & ethnicity) of the country is represented in the design of the flag
 - <https://worldpopulationreview.com/countries/somalia/flag> & <https://www.arabamerica.com/somalis-arab-or-not>
- Re-create the flag of Somalia
 - Draw the 5-pointed Star of Unity (concave decagon)
 - Write a computer program to machine the flag/star with COORDINATE GEOMETRY using a CNC machine
 - Remijan, K.W. (September 2018). Cultivating the Machining Field by Planting Seeds in the Mathematics Classroom. **The Record**. 24-27. <https://ntma.org/wp-content/uploads/2019/02/Sept18-Record-web-compressed.pdf>
 - Have students use a CNC Simulator to check their program
 - ✓ FREE CNC simulator found at: <https://ncviewer.com/>
 - ✓ Directions on how to use the online simulator found at https://youtu.be/Z4V_qKuoMMk
- Partner with a Career-Tech-Education (CTE) teacher in your school/district, a local community college, or a local business to utilize a CNC machine as well as promote career pathways and opportunities
 - Special thanks to the Southwestern Illinois College (SWIC) - Precision Machining Technology Department led by Mark Bosworth, Jerry Bonifield, and Mark Berry - <https://www.swic.edu/academics/career-degrees/precision-machining-technology/>

Explore other Flags of Countries in Africa as well as Across the World

- Reference - <https://www.teachingwhilewhite.org/blog/2019/6/21/a-letter-to-white-teachers-of-my-black-children>
- Remijan, K. (2020). What Country is It in Africa? Teacher Resources. 3. Retrieved from https://digitalcommons.imsa.edu/pfs_tr/3
- Remijan, K. (2020). Day 02 - Friday Night Fun with Flags: GeoGebra for Geometry and Graphing. 19-19-19 COVIDEOS 19 E-Learning Webinars. 2. Retrieved from https://digitalcommons.imsa.edu/covideos_19_webinars/2
- Remijan, K. (Under Review). Flags of Latin America: Culturally Relevant Learning Experiences with Technology to Enhance Geometry & Algebra Concepts.

THANK YOU FOR ATTENDING!

- ✓ Please feel free to contact me at kremijan@imsa.edu if you have questions, if your school/district would like professional development, or if your organization is looking for a presenter for a conference/event.
- ✓ For other PD Opportunities offered through the Illinois Mathematics & Science Academy (IMSA) – Center for Teaching and Learning, please visit: www.IMSA.edu/Educator
- ✓ I would greatly appreciate your feedback by completing a 2-minute survey @ www.tinyurl.com/IMSAsurvey22