

Flags of Africa: Enhancing the Teaching of Algebra and Geometry Concepts with Technology

https://digitalcommons.imsa.edu/pfs_pr/27/

Presented By:

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****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 algebra & geometry concepts: 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 algebra and geometry.

Nigeria

What do we need to know to replicate the flag of Nigeria?

Dimensions or Aspect Ratio

Create the flag using GEOMETRY (squares) 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

*Check the resource list at the end for references

Guinea

- What do we need to know to replicate the flag of Guinea?
Dimensions or Aspect Ratio
- Create the flag using GEOMETRY (squares/rectangles) with Google Sheets Pixel Art found at https://www.controlaltachieve.com/2017/02/sheets-pixelart.html?fbclid=IwAR2V11G_aY_jX_9K5iCN8ox3X-I20QBrP9R-6igFC3KuBIeGKmaTjyN-yhg
- Create the flag using ALGEBRA (linear equations /inequalities) graphing with www.GeoGebra.org

Republic of the Congo

- What do we need to know to replicate the flag of the Republic of the Congo?
Dimensions or Aspect Ratio
- Re-imagine the flag using ALGEBRA (linear equations /inequalities) with www.Desmos.com
- Create the flag using ALGEBRA (linear equations /inequalities) graphing with www.GeoGebra.org
- Geometry with www.GeoGebra.org
 - Insert flag images
 - 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

Explore other Flags of Countries in Africa

- Have students replicate/re-imagine a flag for a country/region/tribe using GeoGebra, Desmos, or a CNC Machine
 - Re-create the flag of Somalia using COORDINATE GEOMETRY with a CNC machine
 - 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
 - Re-image the flag of another country, such as Western Sahara, using COORDINATES & a CNC machine

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Special Thanks:

- Mark Bosworth, Jerry Bonifield, and Mark Berry (Southwestern Illinois College)
<https://www.swic.edu/academics/career-degrees/precision-machining-technology/>

*Resources:

- Remijan, K. (2021). Flag Designs of African Countries: Enriching the Graphing of Linear Equations and Inequalities in Algebra. **The Lighthouse Almanac**. 12-19. www.BBAmath.org
- Remijan, K. (Under Review). Flags of the World: Enriching Algebra and Promoting Global Awareness.
- 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. (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
- Remijan, K. (2020). "What Country is It in Africa?". Teacher Resources. 3. Retrieved from https://digitalcommons.imsa.edu/pfs_tr/3
- Miscellaneous Flag Images Shown During Presentation
https://en.wikipedia.org/wiki/Flag_of_Guinea , https://en.wikipedia.org/wiki/Flag_of_Thailand
https://en.wikipedia.org/wiki/Flag_of_Yemen, https://en.wikipedia.org/wiki/Flag_of_Russia
https://en.wikipedia.org/wiki/Flag_of_Nigeria, https://en.wikipedia.org/wiki/Flag_of_Guyana
https://en.wikipedia.org/wiki/Flag_of_Colombia, https://en.wikipedia.org/wiki/Flag_of_Ireland ,
https://en.wikipedia.org/wiki/Flag_of_the_Republic_of_the_Congo,
https://en.wikipedia.org/wiki/Flag_of_Somalia, https://en.wikipedia.org/wiki/Flag_of_South_Africa
[https://en.wikipedia.org/wiki/Flag_of_Niger#:~:text=The%20Flag%20of%20Niger%20\(French,orange%20roundel%20in%20the%20center](https://en.wikipedia.org/wiki/Flag_of_Niger#:~:text=The%20Flag%20of%20Niger%20(French,orange%20roundel%20in%20the%20center), https://en.wikipedia.org/wiki/Flag_of_Seychelles#/media/File:Flag_of_Seychelles.svg

Other NOTES:

- ✓ 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
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www.tinyurl.com/IMSAsurvey22
- ✓ THANK YOU FOR ATTENDING!