

Flags of Africa: Teaching Algebra & Geometry with Technology

Outline and Resources for Presentation Conducted at the
Illinois Council Teachers of Mathematics Conference
October 17, 2020

<https://ictm.memberclicks.net/annual-conference>

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**If you watched the presentation, I would greatly appreciate your feedback by completing a 2-minute survey. ☺

www.tinyurl.com/IMSAsurvey21

Objectives

- #1 - To share ideas for using flags of Africa and technology to engage students with algebra & geometry concepts: aspect ratio, area, linear equations/inequalities, polygons, & coordinate geometry.
- #2 – To highlight technology such as Google Slides, PixelMath, 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

Blank Grid found under “additional files” at https://digitalcommons.imsa.edu/pfs_pr/27/

Create the flag using ALGEBRA (linear equations /inequalities) with www.Desmos.org

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 the Pixel Math Program
PixelMath 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) 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.org
- Create the flag using ALGEBRA (linear equations /inequalities) with www.GeoGebra.org
- Measure Angles/Distances to classify triangles with <https://www.geogebra.org/calculator/vr7vmtkf>
- Measure Area of a Polygon with www.GeoGebra.org
- Measure Distance/Slope to prove that a quad is a parallelogram with www.GeoGebra.org

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
 - Example of creating the flag of Somalia using COORDINATE GEOMETRY with a CNC machine
 - Example of re-imagining the flag of Western Sahara using COORDINATES with a CNC machine

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Remijan, K. (Under Review). Teaching Math with Flags: Algebra and Geometry Connections to Build Global Awareness.

Remijan, K. (Under Review). Flag Designs of African Countries: Enriching the Graphing of Linear Equations and Inequalities in Algebra.

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_Peru

https://en.wikipedia.org/wiki/Flag_of_Yemen

https://en.wikipedia.org/wiki/Flag_of_the_United_Arab_Emirates

https://en.wikipedia.org/wiki/Flag_of_Russia

https://en.wikipedia.org/wiki/Flag_of_Nigeria

https://en.wikipedia.org/wiki/Flag_of_the_Philippines

https://en.wikipedia.org/wiki/Flag_of_the_Czech_Republic

https://en.wikipedia.org/wiki/Flag_of_Cuba

https://en.wikipedia.org/wiki/Flag_of_Guyana

https://en.wikipedia.org/wiki/Flag_of_the_Republic_of_the_Congo

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_Somalia

https://en.wikipedia.org/wiki/Flag_of_Seychelles#/media/File:Flag_of_Seychelles.svg