**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__0OgfKfvYld31ldT8Fshvq_O2Pr6D9KWLi-EjEo/copy
Create the flag using ALGEBRA (linear equations /inequalities) w/ www.Desmos.com

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-l20QBrP9R-6igFC3KuBJeGKmaTjyN-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
  o  Insert flag images
  o  Measure Angles/Distances to Classify Triangles & Measure Area of a Polygon to Make Conclusions
  o  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
  o  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
  o  Re-image the flag of another country, such as Western Sahara, using COORDINATES & a CNC machine
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  https://www.swic.edu/academics/career-degrees/precision-machining-technology/

*Resources:
- Miscellaneous Flag Images Shown During Presentation
  https://en.wikipedia.org/wiki/Flag_of_the_Republic_of_the_Congo,
  https://en.wikipedia.org/wiki/Flag_of_Niger#:~:text=The%20Flag%20of%20Niger%20(French,orange%20round

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

✔ I would greatly appreciate your feedback by completing a 2-minute survey. 😊
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✔ THANK YOU FOR ATTENDING!