

Tech & Toys to Teach Linear Algebra

<https://tinyurl.com/tech-toys-linear-algebra>

Created and Presented By:

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**After the presentation, I would greatly appreciate your feedback by completing a 2-minute survey. 😊

www.tinyurl.com/IMSAsurvey22

Teachers will: 1) gain new ideas & resources for teaching concepts/skills that build connections within linear algebra and 2) discover innovative activities that engage students thru tech & toys such as CNC Machines, Desmos/GeoGebra, Calculator-Based-Ranger, push toys, water growing toys, and other toys or tech such as dolls & ziplines

#1 Ordered Pairs (& Fractions/Decimals) - CNC Machines

- ✓ Example with Google Slides
 - **DOWNLOAD** – <https://docs.google.com/presentation/d/1LiOgF4VkJNWj0kG2GvOVaNG0jfdJg-8UhN6OlpPJX8/copy>
 - **VIDEO** - <https://youtu.be/cCoq5O2uiss>
- ✓ Article
 - Remijan, K.W. (September 2018). "Cultivating the Machining Field by Planting Seeds in the Math Classroom". **The Record**. 24-27. <https://ntma.org/wp-content/uploads/2019/02/Sept18-Record-web-compressed.pdf>
- ✓ Free CNC Simulator Technology
 - <https://ncviewer.com/> (How to use ncviewer.com found at https://youtu.be/Z4V_qKuoMMk)
- ✓ Special Thanks
 - Mark Bosworth, Jerry Bonifield, and Mark Berry (Southwestern Illinois College) <https://www.swic.edu/academics/career-degrees/precision-machining-technology/>

#2 Linear Equations/Inequalities & Domain/Range- Creating flags using Desmos & GeoGebra

- ✓ Explore (www.Desmos.com and www.GeoGebra.org)
 - How do you change colors, represent inequality symbols, and restrict domain/range?
- ✓ Research Flags (Aspect Ratio, Design, Colors, etc.)
 - Identify equations or Inequalities to replicate (or re-Create) flags
 - Have students find the meaning behind the colors, design, etc.
 - Connect flag design to history, geography, culture, etc.
- ✓ 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, Kelly, "Day 11 - "Travel the World Through Flags: Desmos, Equations, and Inequalities"" (2020). 19-19-19 "COVIDEOS 19" E-Learning Webinars. 11.
 - Remijan, Kelly, "Day 02 - "Friday Night Fun with Flags: GeoGebra for Geometry and Graphing""(2020). 19-19-19 "COVIDEOS 19" E-Learning Webinars. 2. https://digitalcommons.imsa.edu/covideos_19_webinars/2

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#3 Increasing/Decreasing/Constant Functions - Using a CBR Motion Detector

- ✓ Technology Options: TI CBR 2 or TI CBR (NOTE: I purchased my TI CBR via E-bay for \$20)
- ✓ References
 - Remijan, K.W. (Jan/Feb 2019). "STEAMing Up Linear Functions". **Mathematics Teacher**. 250-256. <https://www.nctm.org/Publications/Mathematics-Teacher/2019/Vol112/Issue4/STEAMing-Up-Linear-Functions/>

#4 Systems of Linear Equations - Push Toys

- ✓ Technology Options: TI CBR 2 or TI CBR (NOTE: I purchased my TI CBR via E-bay for \$20)
- ✓ References
 - Remijan, K. W. (Under Development). When Turtle Met Mickey.
 - Resource: <https://education.ti.com/en/activity/search/advanced>

#5 Measurement, Graphs, & Growth Rate – Water Growing Toys

- ✓ Reference
 - Remijan, K.W. (Jan/Feb 2019). "STEAMing Up Linear Functions". **Mathematics Teacher**. 250-256. <https://www.nctm.org/Publications/Mathematics-Teacher/2019/Vol112/Issue4/STEAMing-Up-Linear-Functions/>
 - I purchased my water growing toy from <https://www.stevespanglerscience.com/store/giant-growing-crocodile.html>

#6 Patterns, Slope, & Linear Equations – Ken/Barbie, Ziplines, Balloon Rockets, Lego People, etc.

- ✓ Ken/Barbie Dolls
 - Remijan, Kelly W. (2021). Bungee Jumping with Ken and Linear Equations. *Teacher Resources*. 28. Retrieved from https://digitalcommons.imsa.edu/pfs_tr/28/
 - Video available at <https://youtu.be/GC3vmtV3ucQ>
- ✓ Ziplines
 - Ziplines & Balloon Rockets. Example found at: <https://youtu.be/KqZdHZvwDbA>
 - Remijan, K. W. (October 2016). *The Zipline Rescue Challenge*. **STEAMed Magazine**. 11-15. Retrieved from <https://view.joomag.com/steamed-magazine-october-2016/0560636001474562057?page=11>
 - Remijan, Kelly W. (2020). Ziplines and Stunt Work. *Teacher Resources*. 2. Retrieved from https://digitalcommons.imsa.edu/pfs_tr/2/

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.
- ✓ Check out www.IMSA.edu/Educator for outreach/PD from IMSA – Center for Teaching & Learning.
- ✓ I would greatly appreciate your feedback via 2-minute survey: [www.tinyurl.com/IMSAsurvey22](https://tinyurl.com/IMSAsurvey22)