

VISUALIZATION OF MATHEMATICS

Course Name: Multi-Variable Calculus
Unit/Theme: Visualization of Mathematics

Time Frame: 2 classes
Grade Level: 12

CONTENT AND SKILLS
Learning Objectives: - Students use and compare software that presents 2D and 3D images - Students reflect on the preferred application
Essential Questions (optional): Which graphing application do you prefer?
Students I can statements . . . - I can graph 2D and 3D in CalcPlot 3D, TI Nspire - I can create a trouble shooting document for a software product.
How will you meet the needs of SWD and ELL/MLL students? How will you make sure this lesson is culturally responsive? Students may choose to look at other software products for graphing such as desmos and geogebra.
Content Standards List all standards and how learners will meet the standard
All-A.REI.Represent equations and functions graphically Beyond this standard as students also graph in 3 dimensions.
NYS Computer Science and Digital Fluency Standards List all standards and how learners will meet the standard
9-12.NSD.2 Explain the levels of interaction existing between the application software, system software and hardware of a computing system 9-12.NSD.3 Develop and communicate multistep troubleshooting strategies others can use to identify and fix problems with computing devices and their components.
CASEL COMPETENCIES and/or NYS SEL BENCHMARKS
1C.4a. Identify strategies to make use of resources to overcome obstacles to achieve goals 2.A.5a Demonstrate how to express understanding of those who hold different opinions.

INSTRUCTIONAL PLAN List the steps of the lesson, including instructions for the students.
• Students have been graphing throughout their high school (and middle school) careers. In this lesson, they are tasked with looking at least 2 software products and creating graphs in 2D and 3D. • Students will create a visual or summary statement to compare what they find and which product is preferred. NSD.2 • Lastly, they will create a troubleshooting guide for one of the software products, for a novice user. NSD.3
ASSESSMENT(S) / PROJECTS / PRODUCTS
• Visual or summary statement for comparison • Troubleshooting guide for the novice user
INSTRUCTIONAL TECHNOLOGY INTEGRATION
• Personal devices computer or phone • Handheld Graphing calculator
MATERIALS / RESOURCES
• 3D CalcPlot • Geogebra • Desmos • TI CAS Nspire
Background and Prior Knowledge
• Students are well versed in graphing features on a TI Graphing calculator.