

The Perfect Storm

Introduction: The following lesson introduces students to linear functions in the context of water pressure vs. water tank's height.

Materials:

- Projector connected to a computer with internet to play videos for the lesson
- Copies of each of the following:
 - Warm-Up and Exit Ticket
 - The Perfect Storm Worksheet
 - Water Treatment Conversion Sheet Entitled "State of California, Department of Public Health: Drinking Water Operator Certification Program"
 - Student Surveys

Estimated Timeframe:

- 45 minutes to an 1 hour, depending on how you spread and imbed your think time

Prior Knowledge/Skills Needed:

Before this application lesson, students must be able to:

- Find the equation of a line given 2 points
- Find percent of a number

Common Core State Standards:

CCSS.MATH.HS.A-CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CCSS.MATH.HS.A-REI.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Additional Common Core State Standards:

CCSS.MATH.HS.N-Q.1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CCSS.MATH.HS.N-Q.2: Define appropriate quantities for the purpose of descriptive modeling.

CCSS.MATH.HS.A-SSE.1: Interpret expressions that represent a quantity in terms of its context.

CCSS.MATH.HS.A-CED.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Implementation Suggestions:

- Ask students to think/write/pair/share often so students can verbalize and communicate their mathematics
- Students should do work on the board in groups or pairs

Accommodations/Modifications:

- For English Language Learners:
 - Be sure to have precise definitions of content vocabulary ready ahead of time.
 - Be sure to include think time when appropriate.
 - Ask students to Think/Write/Pair/Share between for each question
- For SPED/504:
 - Allow students to use a calculator for calculations
 - Focus on having students verbalize the process in their own words
 - While students are finding solutions you may ask students for estimated solutions first, this helps students see if they are headed in the right direction with their answers

Extensions:

- Students can use maximum and minimum values to calculate the lines that represent the upper and lower boundaries of the appropriate
- Students can graph the set of solution values (region between the line representing expected values + 2% and expected values – 2%).