

WAMC Lab Template

Math Concept(s): Solving Systems of Equations

Source / Text: Cord Blue Book

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Attach the following documents:

Lab Instructions

Student Handout(s)

Rubric and/or Assessment Tool

Indicate “SPECIFIC” relationship to Science, Technology, or Engineering

Finding the solution to a system of equations is used to calculate chemical mixing ratios.

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Battleships and Mines

Prerequisite skills: Graphing Equations

Lab objective: Understand what the solution of a system of equations represents

Standards:

Mathematics K–12 Learning Standards:

- Solve systems of equations

Standards for Mathematical Practice:

- Model with mathematics
- Look for and make use of structure

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

- Translate quantitative or technical information
- expressed in words in a text into visual form
- (e.g., a table or chart) and translate information
- expressed visually or mathematically (e.g., in an
- equation) into words.
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Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

- | | | |
|---|---|---|
| <input type="checkbox"/> Global Awareness | <input type="checkbox"/> Financial/Economic/Business/Entrepreneurial Literacy | <input type="checkbox"/> Civic Literacy |
| <input type="checkbox"/> Health/Safety Literacy | <input type="checkbox"/> Environmental Literacy | |

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATIONCreativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Critical Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgments and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLSInformation Literacy

- Access and Evaluate Information
- Use and manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE & CAREER SKILLSFlexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership andResponsibility

- Guide and Lead Others
- Be Responsible to Others

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Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Measuring tape
- Chalk
- String or cord
- Masking tape
- Paper and Pencil
- “bombs”

Set-Up Required:

- Gather materials
- Make handouts
- Find clear area for activity

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Students must collaborate as a large group to make grid
- Students must reason a strategy to make grid square and to graph line, and to find solutions

Cooperative Learning:

- Students are working together in a large and a small group

Expectations:

- Students will grok solutions to systems of equations

Timeline:

- This lab should take one to two days

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- Maximizing and minimizing expenses and revenues for a business

Career Applications

- Computer science, business

Optional or Extension Activities

- Looking at systems of inequalities and business game theory

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Lab Instructions

There are two tasks for you to complete. First we must create the grid, then we will place our mines.

1. Together we are going to create a 20' by 20' grid in the parking lot. We will be using cord and chalk to mark our grid off. Just mark the units along the axes.
2. Each group will get a different equation to represent your trade route.
3. Your goal is to figure out where your trade routes intersect the enemy's trade routes.
4. You will be given a cord to help you model your straight lines.
5. When you have completed your mission, write down the coordinates of the location of your mine. (that'll be your x & y coordinates)

The enemy's trade route will be represented using the equation:

$$x - y = -4$$

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Battleship Student Handout

1. What was your trade route?

2. What was the location of the mine that you planted?

3. Explain how you found your solution. How did you find your trade route on the grid? How did you find your enemy's trade route? How did you locate the intersection?

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