

WAMC Lab Template

Math Concept(s): Breakeven Analysis

Source / Text: Cengage Financial Algebra 9-6

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Attach the following documents:

- Lab Instructions
- Student Handout(s)
- Rubric and/or Assessment Tool

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

Lab Plan

Lab Title: How can we afford Prom?

Prerequisite skills: Students should have a basic understanding of the breakeven analysis function.

Lab objective: The objective of this lab is to help the student gain a practical understanding of how the breakeven point is calculated depending on fixed vs. variable costs.

Standards: (Note SPECIFIC relationship to Science, Technology, and/or Engineering)

Mathematics K–12 Learning Standards:

- HSF-IF: Interpret functions that arise in applications in terms of the context.

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
4. Model with mathematics.
6. Attend to precision.

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

- Speaking and listening. Comprehension and Collaboration

Technology

- 3.a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

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Leadership/21st Century Skills:

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

- Global Awareness Financial/Economic/Business/Entrepreneurial Literacy Civic Literacy
 Health/Safety Literacy Environmental Literacy

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

LEARNING AND INNOVATION

Creativity 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 SKILLS

Information 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 SKILLS

Flexibility and Adaptability

- Adapt to Change
 Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
 Work Independently
 Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
 Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects**
 Produce Results

Leadership and Responsibility

- 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

- Markers or pens
- Large poster paper or whiteboard
- [Ti Calculator Tool](#) or Excel Spreadsheet Tool

	A	B	C
1	Breakeven Calculator		
2	The expense equation has the form $Vp + F$.	$-3500p + 238000$	
3	Enter the value of V in cell B3.		-3,500
4	Enter the value of F in cell B4.		238,000
5			
6	The revenue equation has the form $Ap^2 + Bp$.	$-500p^2 + 30000p$	
7	Enter the value of A in cell B7.		-500
8	Enter the value of B in cell B8.		30,000
9			
10	Solve the quadratic equation.	$-500p^2 + 33500p + -238000$	
11	where $a =$		-500
12	$b =$		33,500
13	$c =$		-238,000
14			
15	The price at the first breakeven point is		\$8.08
16	The price at the second breakeven point is		\$58.92
17			
18			
19			

Set-Up Required:

- None.

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

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Cooperative Learning: Students will be divided into small groups to research the cost of prom and fundraiser ideas.

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Expectations: It is expected that students will gain understanding on using the breakeven analysis for their fundraising.

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Timeline:

- This is a 90 minute lab. Half of the lab time will be spent on the research portion.

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- Career applications for this lab could be starting your own business, or a business analyst or operations manager.

Career Applications

- Event Planner, Fundraiser

Optional or Extension Activities

- Groups could research and present real-world examples where breakeven points have significant impacts on market outcomes.
- Students can graph their breakeven analysis using Desmos and set the variables to change automatically to see the functions in action.

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Procedure:

1. Introduction (5 minutes):

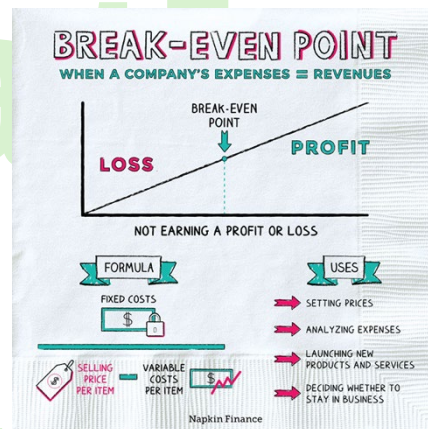
Begin by reviewing the concepts of breakeven analysis and its importance in financial decision-making.

Explain that students will be engaging in a hands-on lab activity to model the breakeven point for a fundraiser.

2. Scenario Selection (10 minutes):

Divide the class into small groups.

Assign each group the task of researching the costs associated with putting on their high school prom. Next students will decide on a fundraiser idea to generate revenue.



3. Fundraiser Research (10 minutes):

Instruct each group to brainstorm and write down ideas for possible fundraisers. Students should find all costs associated with their fundraisers.

Encourage students to think about factors such as price, consumer preferences, production costs, and external influences.

4. Breakeven point calculation (10 minutes):

Once each group has completed their research, have them use their data along with one of the two provide tools to calculate the results of their fundraising initiative.

- [Ti Calculator Tool](#) or Excel Spreadsheet Tool

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19			

5. Breakeven point Analysis (15 minutes):

Once they have completed their computations, have them present their findings to the class. Groups should explain the factors that influenced their fundraiser. Facilitate a discussion where students analyze and compare the different breakeven points on their fundraisers, discussing similarities, differences, and the impact of various factors.

6. Manipulating the Data (5 minutes):

The DJ has dropped out last minute and the replacement will now cost double. The students are going to need to come up with some strategy to make this event happen. Students are tasked with now manipulating some variable of their project to make their new budget work. Allow students to manipulate different variables of their equations, observing how changes in price and quantity can affect the breakeven point relationship.

7. Reflection and Application (10 minutes):

Engage students in a class discussion where they reflect on the activity and its implications. Ask students to apply their understanding of breakeven point to analyze a new scenario or make predictions about a new product or service for their fundraiser.

8. Conclusion (5 minutes):

Summarize the key concepts covered during the lab activity, highlighting the importance of modeling breakeven analysis in financial decision-making.