

Global Trade Teacher Guide

Math in Context



An SB1070 Project

Integrating Global Trade & Logistics into your Math Course

Students love to learn in context – it’s a great way for them to see the tangible use of their standards based classroom concepts. In this teacher guide we will familiarize you with the pre-made math modules you might use as an introduction to global trade concepts in your course.

Overview of Academic Modules for Math

| Module | Assignment | Description | Standards | Pages | Page # |
|--|--|--|---|-------|--------|
| Nearshore vs. Offshore | Nearshore vs Offshore Manufacturing in China vs. Mexico Background Reading | Students learn about the variables they should consider when choosing which country to manufacture in | Multi-Subject Background Reading | 2 | 59 |
| | Nearshore vs Offshore Manufacturing in China vs. Mexico | Creating & Graphing Linear Equations to identify the best manufacturing facility | CCSS Math Modeling Standards A-CED.1, F-IF.5, F-IF.6, F-BF.1, F-LE.2, F-LE.5, S-ID.7 | 8 | 61 |
| Expressions In Industry, 3 Assignment Unit | Expressions in Industry Module 1: Ella’s Etsy Store | Evaluate, write & manipulate expressions | CCSS Mathematics – High School Algebra SSE.A.1, SSE.A.2 | 6 | 69 |
| | Import Tariffs and the Bottom Line | Students learn about import tariffs and how they affect the financial bottom line of a company | Multi-Subject Background Reading | 2 | 75 |
| | Identifying International Tariffs | Mini-Activity Students Identify the country of origin of items from their backpack and find out if they are from a free trade zone | Multi-Subject Mini-Activity | 1 | 77 |
| | Expressions in Industry Module 2: Ella’s Game Emporium | Evaluate Expressions Write Expressions Graph an Expression Interpret Meanings of Expressions | CCSS Mathematics – High School Algebra SSE.A.1, SSE.A.2, APR.A.1, APR.A.2, CED.A.2, REI.A.3, HSA-FIF.A.4 | 6 | 79 |
| | Preparing your Elevator Pitch | Giving your “Elevator Pitch” is a key beginning to investor relations | Multi-Subject Background Reading | 2 | 85 |
| | Investment Profile and Profit Prediction | Knowing the financial ins and outs of your company is key to getting investors on board | Multi Subject | 2 | 87 |
| | Expressions in Industry Module 3: Ella’s Investment Profile | Students write expressions to describe the finances of their company, then use an interactive spreadsheet to predict future profitability. | CCSS Mathematics – High School Algebra SSE.A.1, SSE.A.2, APR.A.1, APR.A.2, REI.A.3, REI.A.5, S-ID.A.1 | 6 | 89 |

Nearshore vs. Offshore in Depth Teacher Guide



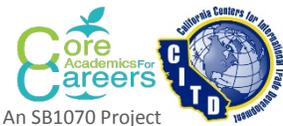
Assignment Overview

Students compare two quotes of cost estimates in order to determine whether it is better to manufacture in China or Mexico. Students are working towards presenting their recommendation to the board of directors. To do this they work with data to find the rate of change for the slope, write two linear equations and graph the data. Finally, they use the graph to show the best place to manufacture their wearable health monitor in a variety of situations. You may also have them prepare a poster or presentation for the “board of directors”.

| Activity | Nearshore Vs. Offshore |
|------------------------------------|---|
| CCSS Covered | <p>A-CED.2 - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>F-IF.5 - Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.</p> <p>F-IF.6 - Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</p> <p>F-BF.1 - Write a function that describes a relationship between two quantities.</p> <p>F-LE.2 - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</p> <p>F-LE.5 - Interpret the parameters in a linear or exponential function in terms of a context.</p> <p>S-ID.7 - Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p> |
| Objectives | <p><i>By the end of this activity students will be able to</i></p> <ul style="list-style-type: none"> • <i>Analyze and organize data into table format</i> • <i>Find the rate of change for a set of data (slope)</i> • <i>Write a linear function based on a set of data points from a real world situation</i> • <i>Graph data with linear relationships</i> • <i>Use graphed linear equations to answer questions comparing two situations</i> |
| Estimated Time | <p>Background Reading & Review Questions: 15-20 Minutes Day 1 Assignment – 30-45 Minutes Day 2 Assignment (or Homework) 20+ Minutes</p> |
| Extension & Application | <p>Great article covering this issue: http://www.meddeviceonline.com/doc/nearshore-or-offshore-how-to-decide-where-you-should-manufacture-your-medical-device-</p> |

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|-------------------|--|
| | <p><u>0001</u> Chase Bank has a great infographic on the comparison between Mexico & China showing Mexico's increased advantage https://www.chase.com/content/dam/chasecom/en/commercial-bank/documents/china-vs-mexico-infographic.pdf Additional resources can be found at www.CareerAcademics.org</p> |
| References | <p>Images are covered under a creative commons license from Pixabay.com http://careersinsupplychain.org/job-roles-profiles/Profile/LogMgr.asp http://www.inboundlogistics.com/cms/article/evaluating-the-true-cost-of-overseas-manufacturing/ https://www.worldindustrialreporter.com/wp-content/uploads/2012/09/Calculating-Landed-Costs1.pdf http://pubsonline.informs.org/doi/pdf/10.1287/ited.1100.0045#page=9&zoom=auto,0,362 http://offshoregroup.com/2013/10/25/mexico-vs-china-by-the-numbers/</p> |

Expressions in Industry In Depth Teacher Guide



Assignment Overview

Assignment 1: Ella's Etsy Store

Evaluating Expressions

In this assignment, students interpret and evaluate expressions to help Ella set the cost of her new card game *35 to Win*. Students evaluate expressions that could be used to manage Ella's manufacturing costs, labor costs, and fees for using an online marketplace.

Assignment 2: Ella's Game Emporium

Writing Expressions with Duties & Tariffs

Ella is planning to expand her business and needs to get a bit more knowhow on importing goods. After a background reading on import duties, students then create and evaluate expressions to set the sales price of toys and games in Ella's store, taking into account the original cost of goods, the tariff based on country of origin and Ella's 50% markup.

Assignment 3: Ella's Investor Meeting

Applying Expressions to Spreadsheets

As students write expressions to help Ella prepare for a meeting with her investors, they use a pre-filled set of data in a Google Sheets spreadsheet (similar to Excel) to put their expressions to work, helping Ella prove her worth to her future investors.

| Activity | Assignment 1: Ella's Etsy Store | Assignment 2: Ella's Game Emporium | Assignment 3: Ella's Investor Meeting |
|------------------------------------|--|---|--|
| CCSS Covered | HSA-SSE.A.1 HSA-SSE.A.2 | HSA-SSE.A.1, HSA-SSE.A.2 HSA-APR.A.1, HSA-APR.A.2 HSA-CED.A.2, HSA-REI.A.3 HSA-FIF.A.4 | HSA-SSE.A.1, HSA-SSE.A.2 HSA-APR.A.1, HSA-APR.A.2 HSA-REI.A.3, HSA-REI.A.5 HSA-S-ID.A.1 |
| Objectives | Students will <ul style="list-style-type: none"> Evaluate Expressions Interpret Meanings of Expressions | Students will <ul style="list-style-type: none"> Evaluate Expressions Write Expressions Graph an Expression Interpret Meanings of Expressions | Students will <ul style="list-style-type: none"> Evaluate Expressions Write Expressions Apply expressions to a spreadsheet Interpret the provided best fit graph of profits to predict future profits. |
| Recommended Materials | Student Handouts | Student Handouts Project a map on the whiteboard – provide markers | Student Handouts 1 web connected Laptop or tablet per group |
| Estimated Time | 45 minutes | Background reading with Q&A 20 minutes Warmup: 5 minutes Worksheet: 45 minutes to 1 hour | Background reading with Q&A 20 minutes Warmup: 5 minutes Spreadsheet Activity: 45 minutes to 1 hour |
| Notes | | <ul style="list-style-type: none"> The background reading is a good homework assignment This map is found at the end of these teacher instructions You could use stickers or students could make a mark on the map if you don't have pins | <ul style="list-style-type: none"> Each group needs to be able to log in to google On a tablet you may need the program "Sheets" in order to use google sheets |
| Extension & Application | Have students read the article <i>Looking Back at Two Decades of NAFTA</i> at http://blog.glencoe.com/?p=683 and discuss the issues, especially focusing on the infographic showing the financial flow of trade goods. | | |
| References | http://www.export.gov/logistics/eg_main_018130.asp <i>A comparison of the hourly compensation by country in US dollars:</i> http://www.bls.gov/fls/ichcc.pdf https://www.conference-board.org/ilcprogram/index.cfm?id=28269 https://learn.flexport.com/import-board-games/ https://ustr.gov/trade-agreements/free-trade-agreements/north-american-free-trade-agreement-nafta http://www.dutycalculator.com/country-guides/Import-duty-taxes-when-importing-into-the-United-States/ | | |