Menu Math Exploration in a Dual Immersion Classroom

Grade Level: 4th

Materials Needed:

- Restaurant menu
- Word Problem Graphic Organizer
- Markers/writing utensils
- Computers with Scratch program
- C.U.B.E.S. sheet
- Sticky notes (optional)

Concepts:

- Adding and subtracting decimals using money
- Multi-step word problems
- Computer science
- Variables

Learning Objectives:

- Use C.U.B.E.S. strategy to solve mathematical multi-step word problem
- Explain the steps that were used to solve the word-problem
- Build knowledge of block coding through Scratch programming and how it connects to the word problem

What do students need to know prior to this lesson…

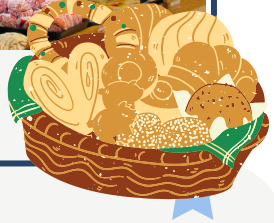
- Students should have had a formal introduction to decimals (to hundredths place)
- Students should understand how to multiply and add decimals
- Students should have been exposed to the concept of money and cents
- Students should have familiarity with a word-problem solving strategy such as C.U.B.E.S.

This lesson provides students with the opportunity to practice all of those skills while they imagine taking their team out to a restaurant for an end of the year celebration.

Introduction:

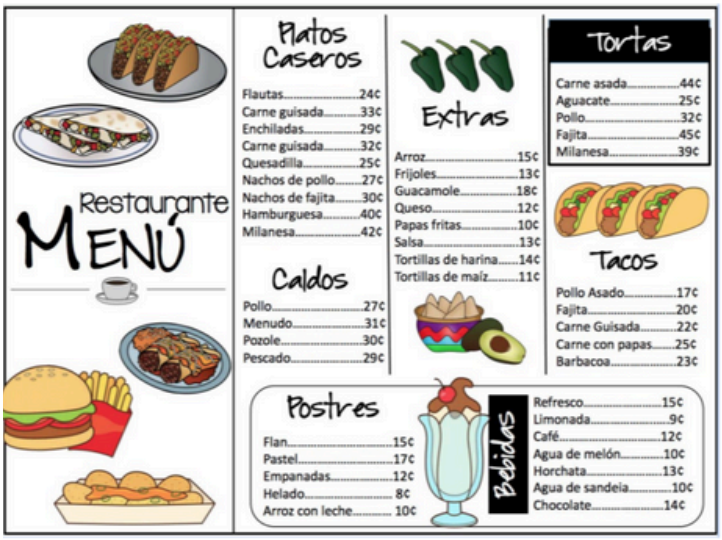
Make content relevant to students.

1. A suggested activity is to plan a field trip to a Mexican panaderia or another restaurant in your community with a menu that is relevant to your students.
2. Have students take pictures of what they would want to buy & have them discuss price and write about it in their journal.
3. Or plan another activity of your choice based on your classroom's needs



Engagement Activity:

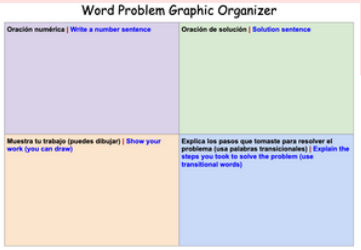
Create a word problem from the menu of the restaurant you visited with your class (see below for example). If you are not able to visit a restaurant, you can create your own menu that is culturally relevant to your students.



Word Problem

María bought fajita nachos and an order of rice. She also bought lemonade.

How much did María spend on food?



In groups or pairs, have students complete the Word Problem Graphic Organizer.

- *Note: If your students need additional support, you may want to solve the word problem together as a whole class and then have students solve a different word problem on their own.*
  - *Suggested additional word problem:* Nereida bought two barbacoa tacos. How much did Nereida spend on the tacos?

Once students complete the graphic organizer, they will be able to communicate and share how their group approached the problem.

Relevant Background Activities:

Math

- Walk through how the Word Problem Graphic Organizer should be used to approach the problem
- Walk through C.U.B.E.S. strategy
- Review any relevant content such as adding and or multiplying decimals and whole numbers
- Review any relevant vocabulary

Computer Science

Explore CS First to acquaint students with Scratch. Try these lessons:

- Welcome to CS First (familiarize yourself with the platform)
- Game Design - Lesson 6: Launcher Game (variables)

Performance Task:

Word Problem: The leader of each table invites their team to eat at a restaurant to celebrate the end of the school year. The leader has $10.00 to spend at the restaurant. Do you think you have enough money to pay for all the food your team members will order? If yes, how much money do you have left?

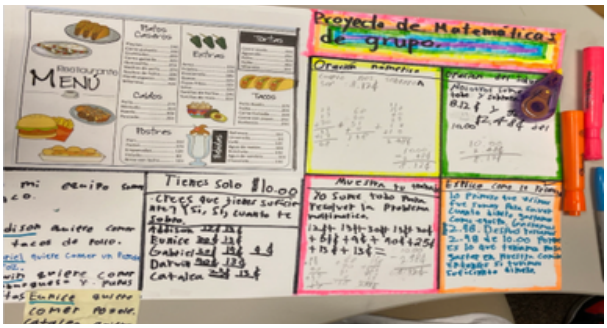
Step 1:

Write the name of each member of your group on a sticky note and put the total of what each one will spend on their food.

Step 2:

Use graphic organizer and C.U.B.E.S. method to think about what step comes next to break down the rest of the problem.

- Circle important numbers (orange)
- Underline the question (yellow)
- Box key words (blue)
- Evaluate/Eliminate (red)
- Solve. Check. Write (green)

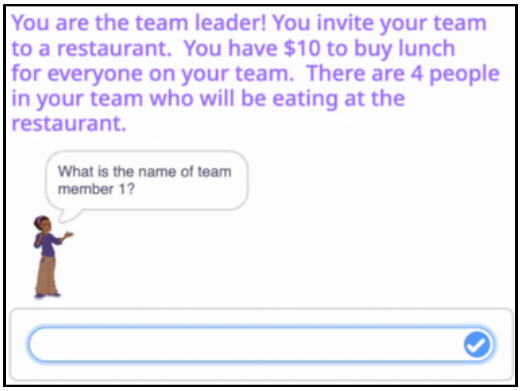


Step 3:

Create a poster or representation per group and have students share what they ordered at the restaurant and how they solved the problem of having enough money to order and if yes, how much money do they have left.

Scratch Activities:

- Complete the same task by using Scratch as a platform (see Expense Calculator: https://scratch.mit.edu/projects/765898621/).



- Alternatively, have students engage with a digital version of the menu (kiosk to order food) and double check their results. As students engage with this Scratch program: https://scratch.mit.edu/projects/1046850093/ have them consider the following:
  - Do my numbers match?
  - If it doesn't, how can I check to see which version is correct?

Extensions:

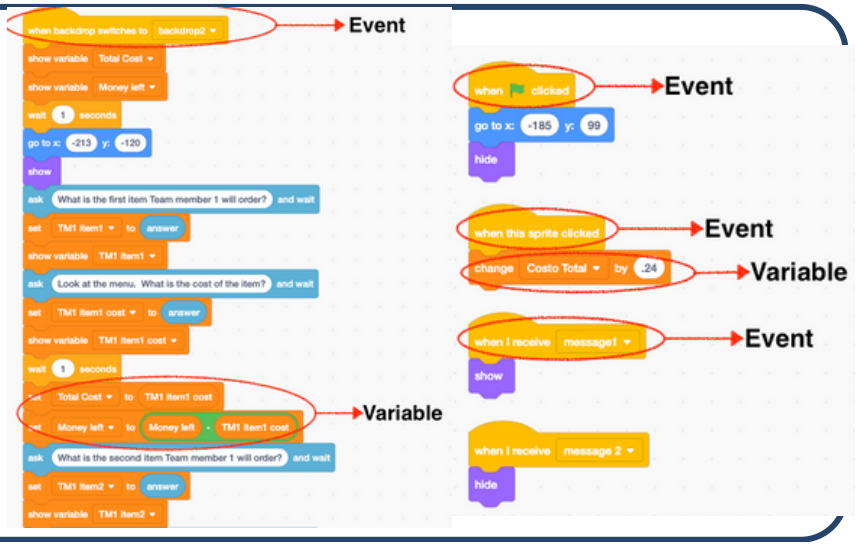
- The Expense Calculator program currently limits each team member to 3 items, you can increase the number of items to 4 or 5 and have them go through the task again to see if they have enough money to pay for all of the additional food.
- For the Digital Menu, have students change the pricing of the items or add additional items along with the pricing of those new items, or create their own menu for their own restaurant / eatery.

Computer Science Concepts:

An explicit call out of a few select computer science concepts is important for students to realize that they are engaging in CS. In this lesson you can explicitly call out:

- Variables
- Events

It's recommended that only 1-2 concepts are introduced at a time. This allows students to grasp the concepts in a manageable way.



Assessment:

- Teacher observation of student work (formative assessment of conceptual understanding - got it/didn't get it)
- Assess level of engagement
- Types of questions being asked
- What strategies were utilized by individuals vs. in a group?
- Formative assessment from your own curriculum

Career Connections:

Did you know…

That there are many careers in the food industry that use *multiplication and computer science* in their everyday workday, let's take a look at some of those careers:

- **Software engineers** design and develop computer programs/applications to make life easier for people and clients. Have you ever been to a restaurant that uses tablets to order your food? Software engineers are the ones who create that for the restaurant.

Standards

Common Core Math Standards	
4.OA.2.	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.NBT.4.	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

English Language Development & Corresponding Common Core ELA/Literacy Standards	
4.A.Collaborative.1	Exchanging information and ideas with others through oral collaborative discussions on a range of social and academic topics.
SL. 4.1, 6	1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. 6. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation.
L.4.1, 3, 6	1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. 3. Use knowledge of language and its conventions when writing, speaking, reading, or listening. 6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).

Computer Science Student Standards

CA CS 3-5.AP.11.	Create programs that use variables to store and modify data.
CA CS 3-5.AP.14.	Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features.
CA CS 3-5.AP.17.	Test and debug a program or algorithm to ensure it accomplishes the intended task.
CSTA 1B.AP.09.	Create programs that use variables to store and modify data.
CSTA 1B.AP.12.	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.
CSTA 1B.AP.15.	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

CSTA Teacher Standards

1a.	Apply CS practices
2c.	Represent diverse perspectives
4c.	Design inclusive learning experiences

*This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.*

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