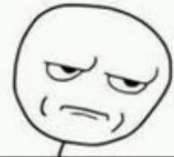


TAXES?



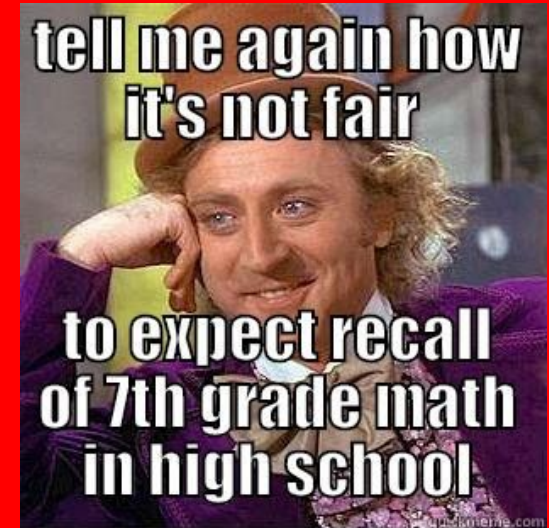
## Hands on Approach to Taxes and Tips

Math. The only place  
where people buy 60  
watermelons and no  
one wonders why.



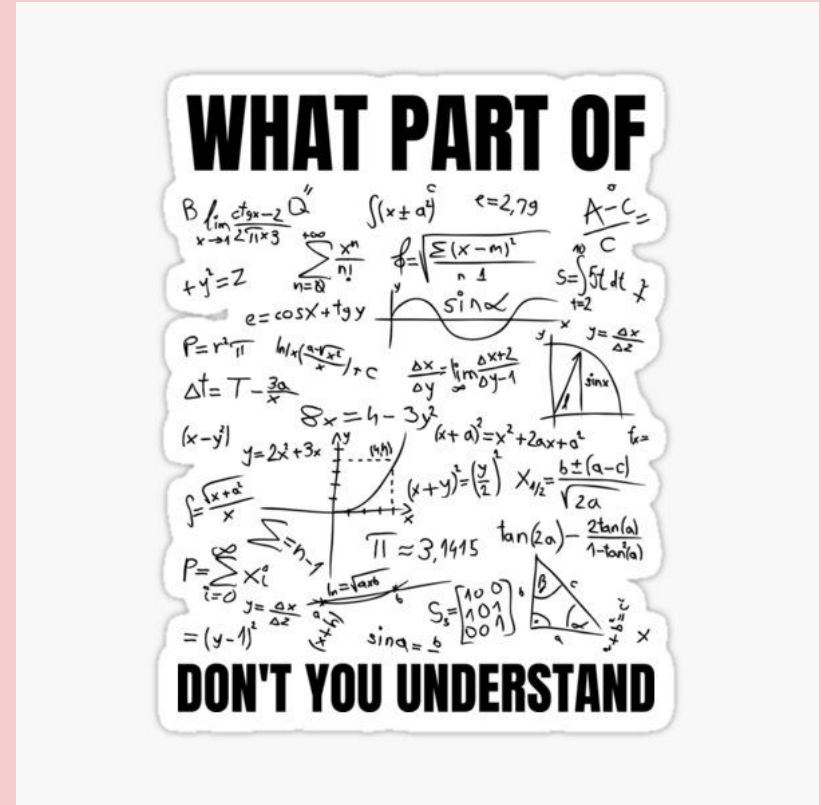
# The method behind the madness

- Taxes and gratuities were concepts that I felt were important when teaching students about proportions.
- I wanted to step outside the box and do a hands-on activity using menus and real life experiences that students might encounter in daily life.
- I was anxious to teach abstract concepts using tangible experiences in order to promote better retention and understanding.
- I felt that this approach allows students to apply mathematical skills in real-world contexts, enhancing their problem-solving abilities and their financial literacy.



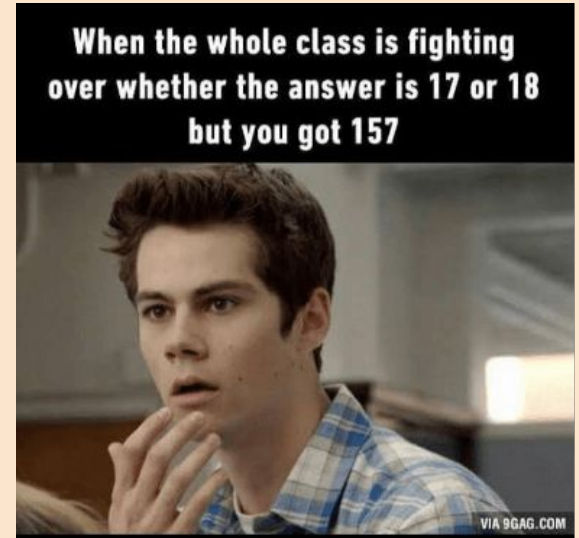
# Hypothesis

Students will have a better understanding of how one calculates tips and added tax numbers as a result of a hands-on approach to this topic. Students will score in the 80% grade percentile or above after experiencing this hands-on approach to math add-ons.



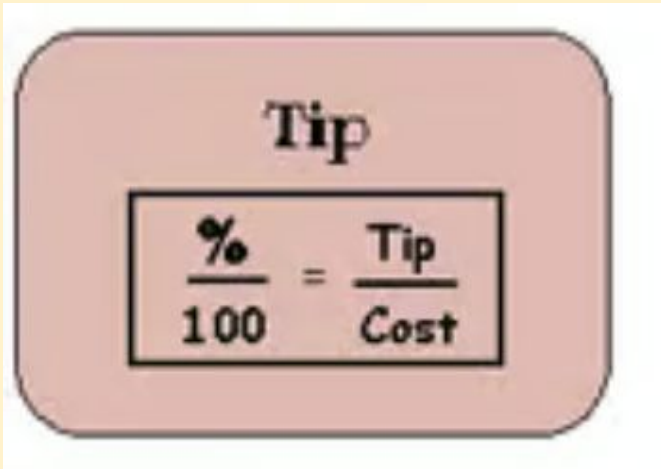
## How did you determine that they needed this instruction? Why is it important for them to learn this concept?

Once I examined students comprehension of the concept of ratios and proportions, I knew that they were ready to understand how taxes and tips are calculated as percentages of a total amount. If some students struggled with calculating percentages I suggested that they may benefit from setting up their taxes and tips in proportions. I realized that some students may not be able to make connections to the real world when working in a text book so I came up with a real-life scenario like dining out and ordering from a restaurant so that it may benefit them when learning about how to tip and how taxes are calculated.



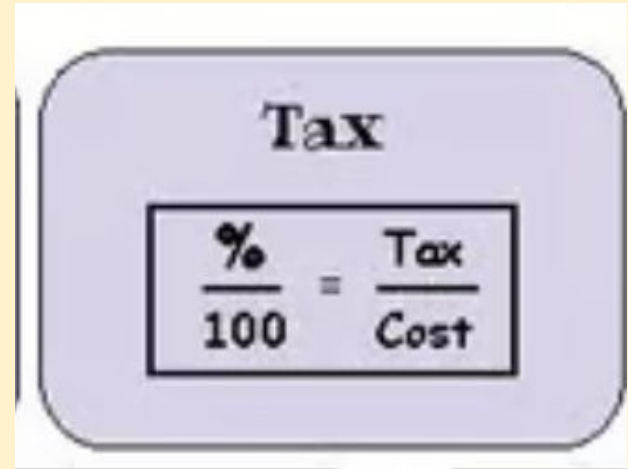
## Challenges... if any

The challenge in teaching taxes and gratuity often lies when students set up proportions.



A diagram for calculating a tip. It features a light red rounded rectangle with the word "Tip" centered at the top. Below it is a black-bordered box containing the proportion  $\frac{\%}{100} = \frac{\text{Tip}}{\text{Cost}}$ .

Use this formula to calculate the tip amount



A diagram for calculating tax. It features a light purple rounded rectangle with the word "Tax" centered at the top. Below it is a black-bordered box containing the proportion  $\frac{\%}{100} = \frac{\text{Tax}}{\text{Cost}}$ .

Use this formula to calculate the tax amount

# How to set up the task

I knew that before opening up the textbook I wanted students to have a real life understanding of this concept..

I asked students who has eaten at a restaurant and who has seen their parents leave extra money on the table. When they all raised their hands I said that is tipping. Many students did not understand the concept of tipping and why they needed to add more money to a meal they already paid for. A lot of students said can we dine and dash. I realized that they had no background knowledge of what it means to go out to a restaurant and pay for a meal and what it means to be a server so I explained to them that servers do not get paid minimum wage their paychecks are the tips that they make and that's why it's always important to tip because that is how that server gets to eat. I also explained that when you dine and dash the server has to pay that not the restaurant. So if the server gets paid a \$5 tip for every meal that they serve and then a large party dines and dash that server now lost their paycheck and probably will still owe the restaurants more money. Once they fully understood the concept of tipping I knew that I could then proceed with the lesson.

# How to set up the task continued...

1. Have students in groups
2. Assign a student to pass out the menus (they will be the server)
3. Explain to the group that as a collective pick ONE/TWO items otherwise they will each sit there looking at the menu as if they are ordering
4. Set up a tip percentage of your choice, I chose 25% and set up a tax percentage, I chose 7.5%
5. The server will then write all the items on the board along with the prices
6. As a class calculate how much the food bill is
7. Then tell the class to solve for tip and tax amount using the set up of proportions
8. (For the groups that already finished finding the amounts) ask them to solve for the tip and tax amount by using percentages and or setting up to find the total amount using proportions
9. Once each group has completed finding the amount I would then ask them to find the total amount of the bill ( $\$ \text{food bill} + \$ \text{tip amount} + \$ \text{tax amount}$ )
10. I then would have each of the students from the group come up and explain the work that they did with their group and how they went about solving the problem.




# Materials needed



## White Boards

10/27/23, 7:53 AM Willow & Whisk | Our Menu



Q Search...

BREAKFAST LUNCH DRINK

### TO SHARE

**Mini Brioche French Toast** 13  
Cornflake crusted, cinnamon sugar dusted, strawberries and bananas, whipped cream cheese topping, maple syrup

**Frittata Bites** 12  
Caramelized onions, fontina cheese, red pepper coulis

**Pumpkin Spice Poppers** 10  
Pumpkin spice cream cheese topping, candied pecans

### MAINS

**Buttermilk Pancakes** 14, *Gluten Free +\$2*  
Strawberries, bananas, maple syrup

**Pumpkin Pancakes** 16  
Pumpkin spice cream cheese topping, candied pecans, maple syrup

**Lemon Ricotta Pancakes** 16  
Lemon curd, blueberries, maple syrup

**Brioche French Toast** 16  
Maple bourbon butter, spiced candied pecans, bananas, maple syrup

**Overnight Oats** 12  
Rolled oats soaked overnight with almond milk, chia seeds, Fuji apples, cinnamon & nutmeg. Topped with dried cranberries, bananas, & walnuts.

DOWNLOAD

Dairy

*Our concept and menu are designed with two key ingredients in mind: fresh and great food. As we're taking a new approach to breakfast and lunch, every meal, we're dedicated to fresh ingredients and an elevated culinary experience. Whether it's your first cup of coffee in the morning or your salad at lunch, we've put thought and soul into every bite.*

\*Served with a side of maple-glazed Brussels.

## Menus



# Success of lesson

**During our 82 minute block period students demonstrated success in the lesson on taxes and gratuity by effectively applying proportions to solve calculations based on the hands-on menu activity.**

**100% of the students understood how to calculate the tax amount, the tip amount, and how to find the total amount that they spent at the restaurant.**

**5% of the students calculated the taxes and tips by setting up proportions using the total percentage**

**95% of the students calculated the taxes and tips by setting up 2 different proportions (one for tax and then one for tip) and then added the \$Bill + \$Tip + \$Tax**



# End Result

**Students were working for two weeks on setting up proportions and percentages. Once they finished the lesson from percent change to simple interest we did a review game called *The Unfair Game* where they had the opportunity to work for 45 minutes on a packet that had questions from each math unit. For the next 30 minutes there I structured a random name and number generator. The student whose name appeared was called on and had to answer a specific question. If they got the answer correct, they put their name under a listed prize. It is called *The Unfair Game* because students can steal each other's prizes by erasing the name underneath the prize (there are only 4 prizes). The next day, students took the unit test. The class average for that test was an 87%.**

# Test

## Module 2 Quiz

Name: \_\_\_\_\_

Version A

Date: \_\_\_\_\_

### Percent Change

1. The tuition at Arizona State University increased from \$59,000 in 2015 to \$75,000 in 2018. What is the percent increase in tuition?
2. When the movie Transformer first came out on DVD, it cost \$25.99. Now you can buy the DVD for \$18.99. What is the percent change? State whether it is an increase or decrease.
3. Game Stop is having a sale, and all games are reduced by 55%. If a game is now \$39.99, what was the original price? Round your answer to the nearest cent.
4. Bloomfield Middle School has 25 eighth grade boys on each team this year, but this is a 28% decrease from the prior year. How many 8th grade boys were on each team last year? Round to the nearest whole number.

### Markups and Markdowns

5. Mike's Pasta and Sandwich shop buys chicken cutlet for \$1.75 at the store and plans to bread them and sell them at the shop. He plans on marking them up 275%. How much will he be selling them for?

6. Taco Bell Steak and Bacon Grilled Cheese Burrito has 890 calories. Taco Bell makes a lite burrito with 25% less calories. How many calories is Taco Bells Lite burrito.
7. Mr. Mendez loves Butter Fingers. Next month he plans on cutting down the number he eats by 16%. He normally eats 175 each month. How many butterfingers will he eat next month?
8. Write an equation to show the new price of Nike Dunks that are currently \$190 that are discounted at 18%. Let  $y$  represent the new price.

### Taxes and Gratuities (Tips)

9. Marcie paid \$8.10 for a shirt, including sales tax. The sales tax was 8 percent. What was the original price of the shirt before tax was added?
10. Jayson went to Longhorn all by himself and had a 6-course meal. The food bill was \$286.00. Longhorn tax rate is 7.6%. Since Jayson decided to eat a lot today the tip percentage increased to 25%. What is the total?

11. Teacher A buys a Hellcat SRT for \$68,759. The tax rate is 5.5%. Write an equation, let  $y$  be the total purchase of the car. Round to the nearest cent.

### Commission and Fees

12. Esteban, an art dealer, earns 19% commission of the dollar value of the art pieces that he sells at the Bizzell Gallery. Esteban sells a Da Vinci painting for \$17,890. What is the total commission that he made for selling the painting?
13. John the real estate agent makes a base salary of \$34,550 annually with a commission of 1.25% of the value of each house he sells. He sold 10 houses for \$15,000,000 this year. What is his annual earnings?
14. Keidy is a car saleswoman who makes a base monthly salary of \$500 with commission of 22.7% of the value of each car she sells. In addition, each time her client signs that day, she receives a \$6.00 service fee.  
  
This month, Keidy sells 4 cars each valued at \$65,000, and two of her clients signed that day. How much does Keidy earn this month?

### Simple Interest

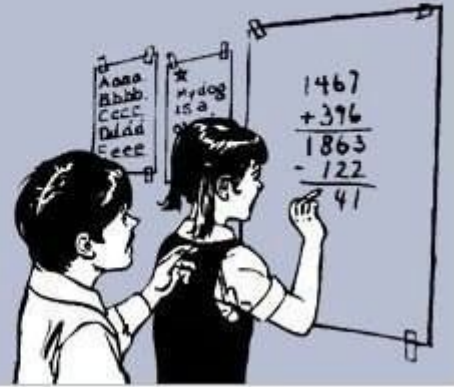
15. Derek is going to Northwestern University. Each year he takes out a loan of \$20,000. He attends college for four years. Derek must repay the loan at a rate of 7.8% simple interest per year over 8 years. What is the total amount of interest he will have to pay on his loan?
16. Patrick Mahomes borrows \$4,580 from Travis Kelce at 3.8% simple interest per year. When Mahomes pays the loan back in 4 years later, what is the total amount that Mahomes ends up repaying?

# The

# End

I'm right 98% of the time.

The other 3%  
is when  
I have to solve  
math problems.



someecards  
user card

