Are There Math People?

A THINKLAW MATH LAB

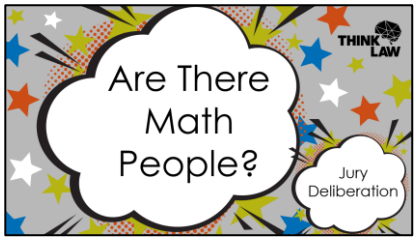
Description	Thinkers will consider a real-life legal case to be introduced to the concept of issues and interests. Thinkers will then apply this approach to discuss why some people might say, "I am not a math person."

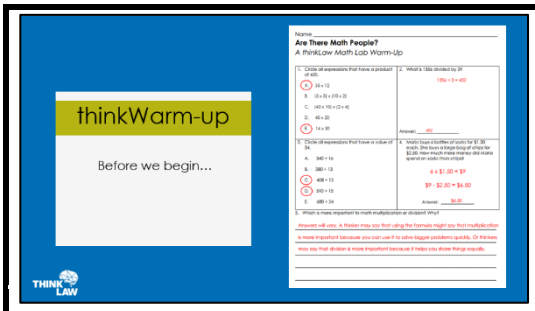
Indiana Academic Standards

3.CA.4: Model the concept of division of whole numbers with the following models: partitioning, sharing, and an inverse of multiplication. Model the properties of 0 and 1 in division using objects or drawings. (E)
4.CA.1: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning. (E)
4.CA.2: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning. (E)
5.CA.1: Find whole-number quotients and remainders with up to four-digit dividends and two-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning used. (E)
5.CA.10: Solve real-world problems involving addition, subtraction, multiplication, and division with decimals to hundredths including problems that involve money in decimal notation (e.g., by using equations, models or drawings, and strategies based on place value or properties of operations to represent the problem). (E)
E: Essential IDOE standards

Lesson Materials

- thinkLaw Student Work pages
- Writing Utensils



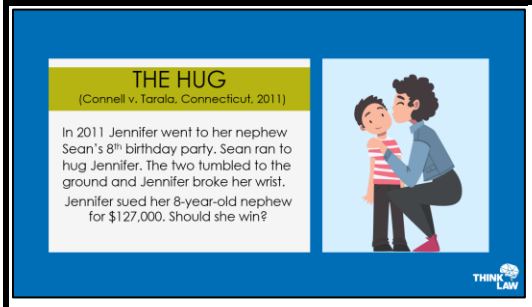


Instructor's Note:
thinkLaw Math Labs have been created with 5 warm-up problems designed to serve multiple purposes: pre-assessment tool, a review tool, an activation of learning, or a readiness tool.

The purpose of the warm-up section is to offer students a brief but effective practice session lasting approximately 5-10 minutes. If students encounter difficulties with any of the problems, it's perfectly fine to proceed, as the Math Lab is structured to provide support and scaffold their learning.

In the slides provided, you'll find a designated prompt indicating where to incorporate the warm-up section with your students. The slide can also serve as an opportunity to review the answers to the warm-up problems together with your students before continuing with the math lab.

For convenience, we recommend printing the warm-up and cool-down sections front to back on a single sheet of paper, facilitating easy access and organization during the Math Lab session.

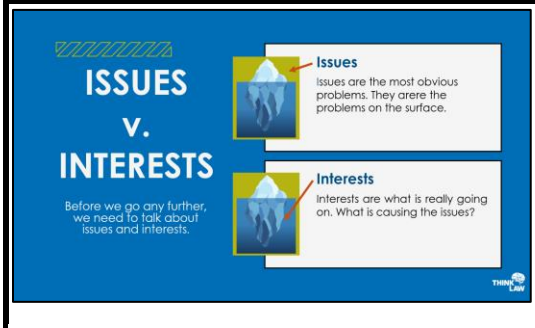


In 2011 Jennifer went to her nephew Sean's 8th birthday party. Sean ran to hug Jennifer. The two tumbled to the ground, and Jennifer broke her wrist.

Jennifer sued her 8-year-old nephew for $127,000. Should she win?

What is your gut reaction? Why? Allow thinkers to share their gut reactions. Many thinkers will feel that it is unreasonable for the aunt to sue her nephew. The amount of money is very high for a child to pay. Thinkers may speculate that something else is going on behind the scenes. Thinkers may suspect that the boy's family may be rich or there must be some family drama behind the scenes.

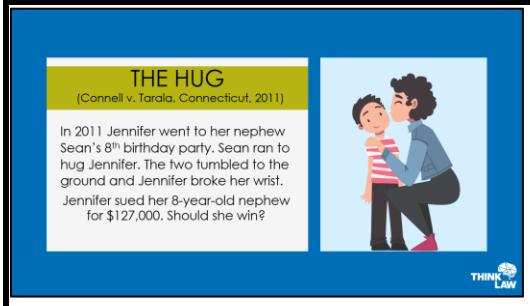
Teacher Note: Use this as an opportunity to conduct a class poll through counting tally charts, creating a graph, creating a percent or ratio.



Before we go any further, we need to talk about issues and interests.

- Issues are the most obvious problems. They are the problems on the surface.
- Interests are what is really going on. What is causing the issues?

Lawyers think about issues and interests every day. Let's go back to the hug case. First, we will review the story.



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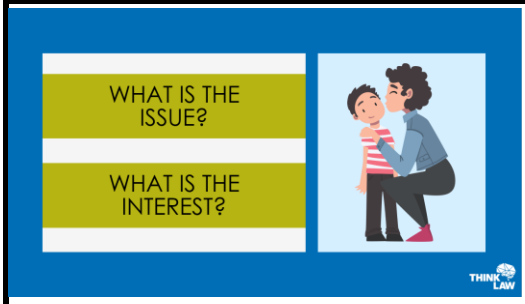


What is the issue in this case? What is the most obvious problem? Sean hugged Jennifer, they fell, and she broke her wrist.

What is unusual about this case? Do you think this is an issue that would lead most people to file a lawsuit against an 8-year-old family member? Why or why not? Most thinkers will say no. Most people would not sue a young child for a hug gone wrong.

What is really going on? Tell me what you think might be happening and explain what makes you believe this could be a possibility. Thinkers may say the following:

- Sean's family might be rich. Jennifer could just be trying to get money.
- Sean might be out of control. The hug might have been more of an attack. He might be violent, and Jennifer might be trying to get her family to wake up.
- Jennifer might have a problem with Sean's parents. She could be trying to get back at his parents.

If you have time and want to further discuss the case, you could ask the following probing questions:

- To find Sean guilty of battery, Jennifer must prove the following:
  - Sean's actions were intentional.
  - Sean's actions involved contact with another person.
  - Sean's actions were harmful or offensive.
  - The actions caused damages.

  Which element would be the most difficult to prove? Which element would be easiest to prove?
- What is the best argument Sean is liable for battery? What is the best argument Sean is not liable for battery?
- What questions would you like to ask about this case? Why are the answers to these questions important?
- What would the world look like if people regularly sued young children for accidents?
- What would the world look like if young children could not be held accountable for seriously injuring adults?

What happened?

Jennifer wanted the homeowner's insurance to cover the expenses from her injury. The insurance company offered her $1. Jennifer's only option to get the insurance company to pay was to get a judge to decide that Sean was guilty of battery. Jennifer lost her case.

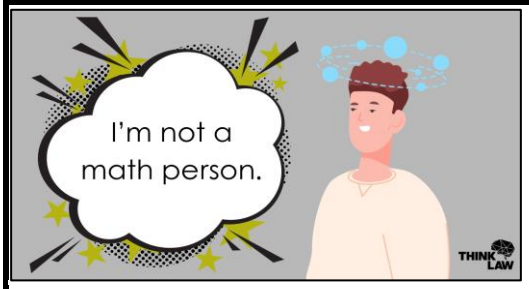
Probing Questions:

- What is your gut reaction to the outcome of this case? Do you agree with the decision? Why or why not?
- Did the new information about the insurance company change your perspective on this case? Why or why not?

Teacher Note: This is another opportunity to conduct a class poll through counting tally charts, creating a graph, creating a percent or ratio.

Thinking about issues and interests can help solve a lot of problems.

Let's look at a common one in schools.



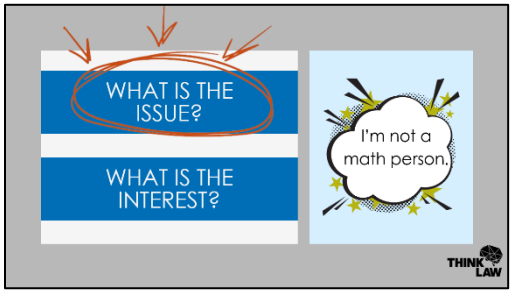
Have you ever heard anyone say, "I'm not a math person?" Allow thinkers to share. What problems can this type of thinking create? Thinkers may be aware that mindset is important. If a person really believes that they cannot do math, they will likely struggle with math.

Probing Questions:

- It is not just kids that say this! Have you ever heard an adult say this phrase? How do you think it impacts kids when adults say that they are not math people?
- Why do you think this is such a common phrase?

There is no such thing as "math people." A baby may be born with blue or brown eyes, but a baby is not born a math person or not a math person.

So, what makes someone say or think that they are not a math person? Let's use issues and interests to think a little deeper.



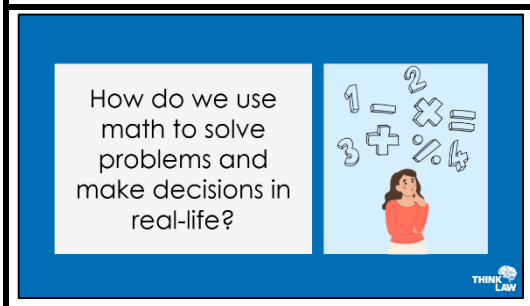
What's the issue?

Thinkers may say things like:

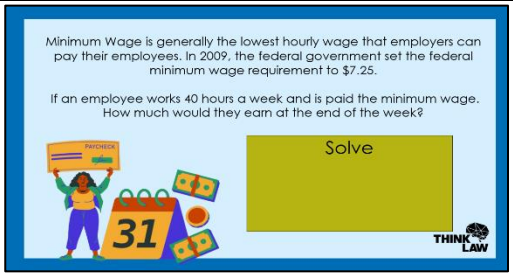
- I just don't like math.
- Math is boring.
- There's no point, I'll never use this when I'm out of school.

Teacher Note:

Thinkers can work individually, with a partner or in a small group to cultivate a list of whys. Give thinkers time to work and leave time to share the reasons with the class.



How do we use math to solve problems and make decisions in real-life? Thinkers may say that we use math all the time to figure out things like how much money we have, how long it takes to do things, or what to buy at the store. Math helps us make smart choices and solve problems.



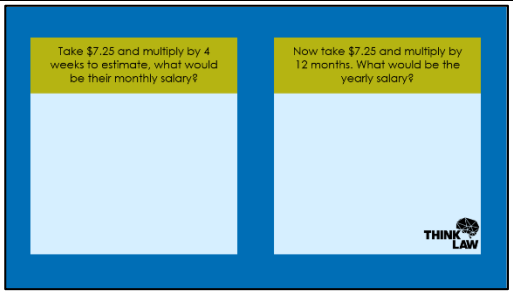
Minimum wage is generally the lowest hourly wage that employers can pay their employees. In 2009, the federal government set the federal minimum wage requirement to $7.25.

If an employee works 40 hours a week and is paid the minimum wage, how much would they earn at the end of the week? $7.25 x 40 = $290

Probing Questions:

- Do you think it's a fair amount? Why or why not?

Teacher Note: There are two real-life scenarios for thinkers to practice math. This is an opportunity to prioritize the student learning goal. The class can be divided into two groups, and each can solve one of the problems and then share out. You may also choose to just work through one of the two examples.



Take that amount and multiply by 4 weeks to estimate, what would be their monthly salary?

$290 x 4 = $1,160

Now take that amount and multiply by 12 months. What would be the yearly salary?

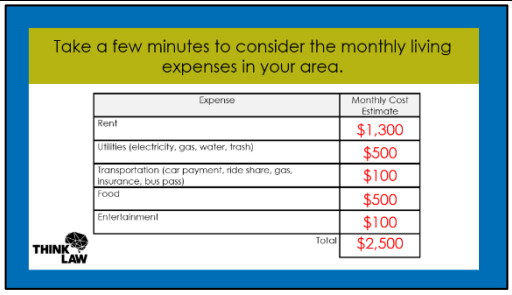
$1,160 x 12 = $13,920

Teacher Note:

It's important to point out to students all the money that will be taken out of that monthly total: federal, state, and local taxes, social security, insurance fees, child support, etc.

Probing Questions:

- Do you think it's a fair amount? Why or why not?
- Should the minimum wage be the same for everyone? Why or why not?
- What would the world look like if there were no minimum wage?

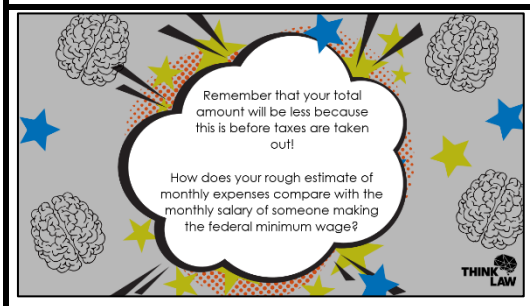


Take a few minutes to consider living expenses in your area.

Teacher Note: This exercise is designed to just give thinkers a quick estimate of the cost of living in your area. The numbers shown are national averages.

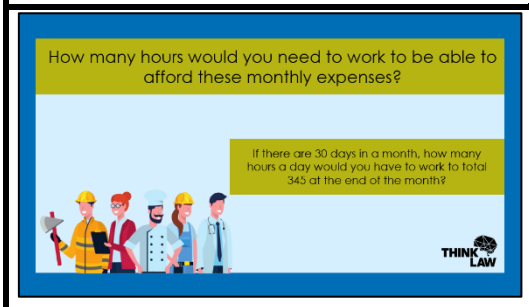
Options include:

- Allow thinkers to fill in the table with their best estimate.
- Have the class fill in the table together with the teacher giving them basic estimates of these costs.
- Allow thinkers a few minutes to research these costs online.



Remember that your total amount will be less because this is before taxes are taken out!

How does your rough estimate of monthly expenses compare with the monthly salary of someone making the federal minimum wage?



How many hours would you need to work to be able to afford these monthly expenses?

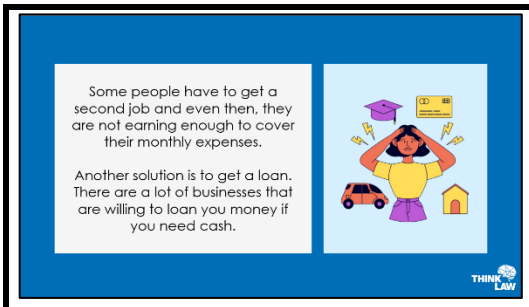
$2,500 ÷ $7.25 = 344 R35 or 345 hours

If there are 30 days in a month, how many hours a day would you have to work to total 345 at the end of the month?

345 ÷ 30 = 11 R15 or 12 hours

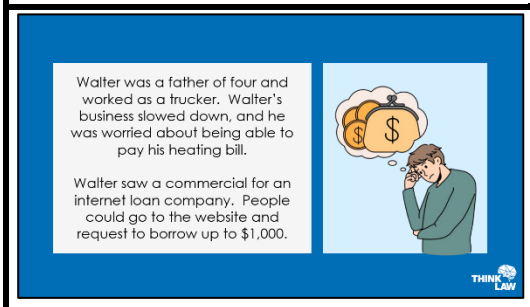
Probing Questions:

- Is $7.25 a fair amount? Why or why not? If it's not, then what is a fair amount for the minimum wage?
- What would the world look like if everyone had to work 345 hours a month to afford their monthly expenses?



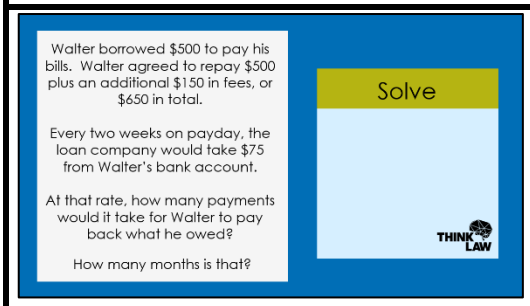
Some adults have to get a second job and even then, they are not earning enough to cover their monthly expenses.

Another solution is to get a loan. There are a lot of businesses that are willing to loan you money if you need cash.



Walter was a father of four and worked as a trucker. Walter's business slowed down, and he was worried about being able to pay his heating bill.

Walter saw a commercial for an internet loan company. People could go to the website and request to borrow up to $1,000.



Walter borrowed $500 to pay his bills. Walter agreed to repay $500 plus an additional $150 in fees, or $650 in total.
Every two weeks on payday, the loan company would take $75 from Walter's bank account.

At that rate, how many payments would it take for Walter to pay back what he owed?

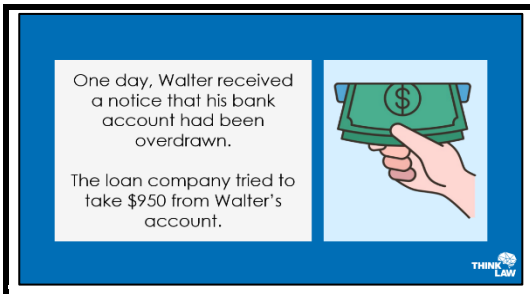
650 ÷ 75 = 8.6 or 9 payments

How many months is that?

You're paid twice a month, 9 ÷ 2 = 4 R1 months

Probing Questions:

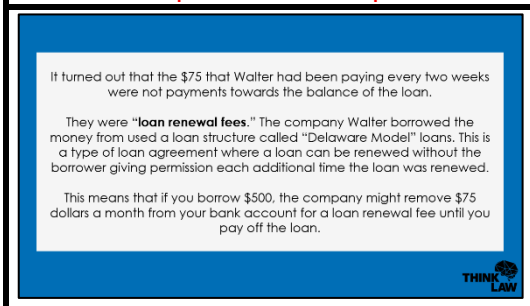
- Would you agree to borrow $500 if you had to pay back $650? Why or why not?
- Is the service fee too highs? Why or why not?
- What questions would you ask about the loan? If you were applying for the loan online, how would you find the answers to your questions? Why are the answers to these questions important?



One day, Walter received a notice that his bank account had been overdrawn. The loan company tried to take $950 from Walter's account.

Probing questions:

- What possible explanations might exist for the charges?



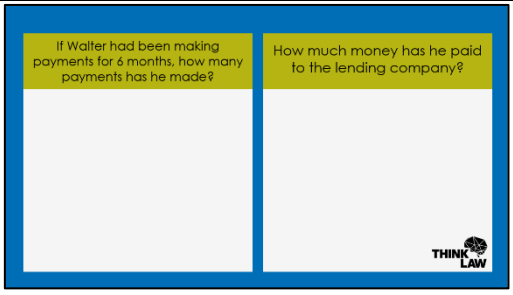
It turned out that the $75 that Walter had been paying every two weeks were not payments towards the balance of the loan.

They were "loan renewal fees." The company Walter borrowed the money from used a loan structure called "Delaware Model" loans. This is a type of loan agreement where a loan can be renewed without the borrower giving permission each additional time the loan was renewed.

This means that if you borrow $500, the company might remove $75 dollars a month from your bank account for a loan renewal fee until you pay off the loan.

Probing Questions:

- What's your gut reaction to Walter's case?

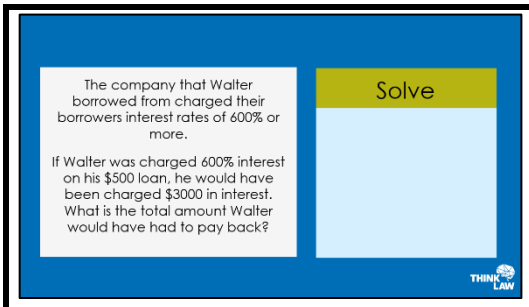


If Walter had been making payments for 6 months, how many payments has he made?

2 payments a month x 6 months = 12 payments

How much money has he paid to the lending company?

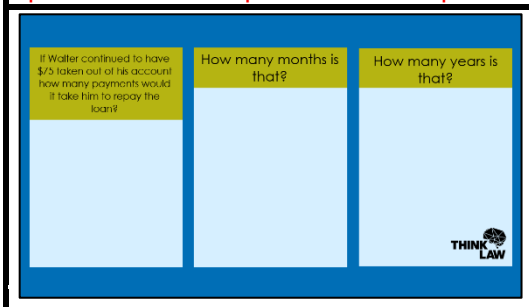
$75 x 12 = $900



The company that Walter borrowed from charged their borrowers interest rates of 600% or more.

If Walter was charged 600% interest on his $500 loan, he would have been charged $3000 in interest. What is the total amount Walter would have had to pay back?

$500 loan + $150 fee + $3000 interest = $3650



If Walter continued to have $75 taken out of his account how many payments would it take him to repay the loan?

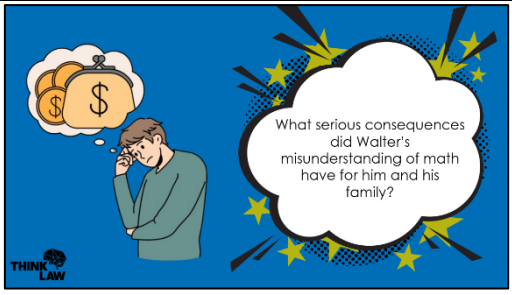
$3650 ÷ 75 = 48.6 or 49 payments

How many months is that?

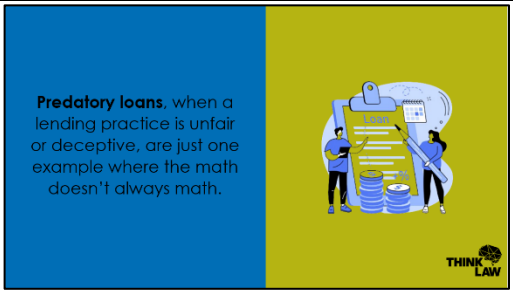
49 ÷ 2 = 24 R1 or 25 months

How many years is that?

25 ÷ 12 = 2 R1 or 2 years and 1 month



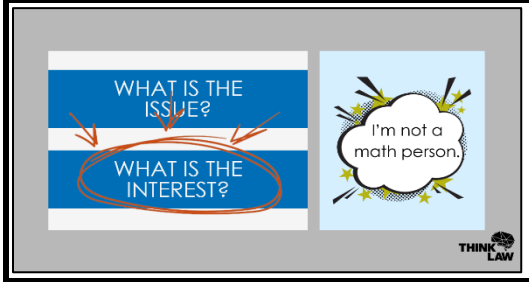
What serious consequences did Walter's misunderstanding of math have for him and his family? Thinkers may say that if Walter had understood how much extra money he had to pay in interest or how long it would take to repay the loan, he probably wouldn't have borrowed the money.



Predatory loans (when a lending practice is unfair or deceptive) are just one example where the math doesn't always math.

Probing Questions:

- Why can't you afford to say or think that you're not a math person?
- What lifelong consequences can



What is the interest?

At the beginning, we listed the issues, the most obvious problems that are on the surface.

After today's thinking, how has your mindset changed? What are the interests? What is really going on? What is causing the issues? Thinkers may say that people don't think they are math people because:

- How math is taught is not interesting
- There isn't a real-life application or connection to the practice problems and worksheets done in class
- Some math is confusing and difficult to understand; it makes students feel frustrated or defeated
- It's not a fun or enjoyable experience to do workbook pages everyday

Probing questions

- What are the top three reasons you think people say, "I'm not a math person?" Why did you choose those three?
- Which one of these reasons do you think is the most difficult to address? Why?
- Which one of these reasons do you think is the easiest to address? Why?
- Do you think we should even address this issue? Does it matter if people think this way? Why or why not?
- How could a person's life change if they stop believing that they are not a math person?
- What would change if people stopped thinking and believing this phrase? How could math class look different? How could school look different? How could the world look different?
- What is easier: believing you are bad at something or believing that you just have not figured it out yet? Why? Why is the word "yet" powerful? Why is it difficult for us to believe "yet" when something feels hard?
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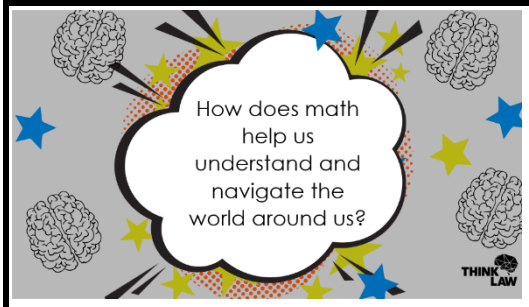

How does math help us understand and navigate the world around us?

Probing Questions:

- How is understanding math different from just knowing how to do basic math? Which is more important? Why?

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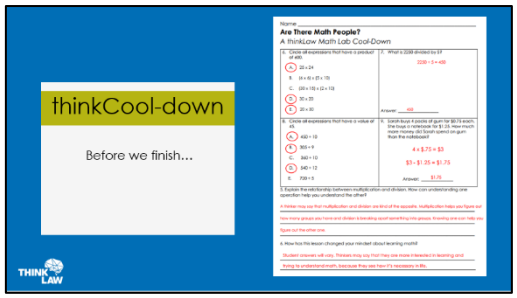
What is one small change we could make to improve our mindsets? Encourage thinkers to revisit their lists. What on the list could be addressed? What would make the biggest impact with the lowest amount of effort? Thinkers may not be able to completely change the math curriculum, but they could press pause and remind themselves this idea is not true when they start to think they might just not be a math person. What small daily things could have a big impact?



Instructor's Note:
Within thinkLaw Math Labs, you'll find 5 Cool-down problems strategically integrated to serve as a demonstration of learning or a post-activity assessment.

The goal of a math lab is to help thinkers redefine their math identity – reshaping how they perceive and interact with math.

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