5th Math Bar method
Main

Teacher: Can you close your covers? Come have a seat on the floor.

Class: Do we have to bring paper?

Teacher: Bring your whiteboard and marker.

Class: What if we don't have a whiteboard?

Teacher: What happened to your whiteboards?

Class: He took my board.

Teacher: All right, I have two.

Class: [crosstalk 00:00:40] ...

Teacher: It's for the whiteboard, not for your arm. Everybody have a marker?

Class: Nope. [crosstalk 00:01:24] ... Teacher?

Teacher: Hmm?

Class: I don't have a whiteboard.

[00:02:00]
Teacher: I gave your table two ... ...

Class: [crosstalk 00:02:01] ...

Teacher: All right, good morning everyone.

Class: Good morning Teacher.

Teacher: Okay, before we start, scouts really quickly. Student and Student.

Class: Student already went. Both of them went.

Teacher: That's okay. I think everybody has gone.

Class: No.

Teacher: No? Well, we'll have new scouts tomorrow. Scouts, while we're down here I want you to be looking for people exhibiting behaviors associated with the three, "Be's." Being safe, being responsible, being respectful ... Whiteboard, marker, come on, down here.

Somebody give me an example of what it looks like to be safe when we're down on the floor. [Student 00:03:08]?

Student: Not hitting anyone.

Teacher: Yeah, not hitting anyone. That's good. Student?

Student: Keeping your hands and objects to yourself.

Teacher: Yeah, keeping your extremities to yourself. If you have to come up to the board, should you be stepping on people?

Class: No.

Teacher: No. Say, "Excuse me." If you hear, "Excuse me," you need to move, or come around the side. There's kind of a little path right here. Student, just so you can see because you're one of our scouts, can I have you switch places with Student? You guys are both sitting [00:04:00] way up front. all right, can I have an example of what it looks like to be respectful? [Student 00:04:09]?

Student: Being nice to each other.

Teacher: Okay, being nice to each other. What would somebody who's respectful sound like? [Student 00:04:17]?

Student: Kind words.

Teacher: Okay, they're going to use kind words. What if I picked on Student to answer a question, would it be very respectful of you to shout out the answer?

Class: No.

Teacher: No, right. What if you really know the answer and you really want to share but it's Student's turn, should you shout it out?

Class: No.

Teacher: No. What if I ask you to give him help, then is it okay?

Class: Yes.

Teacher: Yeah, okay.

Class: We're not supposed to give him the answer.

Teacher: Well, don't give him the answer but you can help him. How about being responsible,

what does it look like to be responsible? [Student 00:04:54]?

Student: Doing your work.

Teacher: Okay, doing your work, right. What else? [Student 00:05:01]?

Student: Using an [inaudible 00:05:03] voice.

Teacher: Okay, using appropriate voice. Right, so if you're sitting way in the back should you be quiet like this?

Class: No.

Teacher: No, right. Use a level that we can hear. What if you're talking to your neighbor, should you be talking to your neighbor like this?

Class: No.

Teacher: No, right. You're going to give them hurt ears if you do that.

Class: A headache.

Teacher: Yeah, a headache. Okay, so over the weekend I did some research about how children in Singapore do math.

Class: What is Singapore?

Teacher: Singapore is a country.

Student: It's like near the Philippines.

[00:06:00]
Teacher: Yeah, it's near the Philippines, Student's right. Kind of right below China. Their Ministry of Education, kind of like our Department of Education, fifty years ago they did research and they found that they were really, really bad at math. Really bad at math, so they did about fifteen years of research on how children best learn math. They rewrote all of their textbooks so that they have the best ideas and research in their math textbooks right now.

What happened because of that? Now they're really, really good at math. They're like one of the top three countries with the highest number of students who are proficient in math. I think it's like ninety-five percent of their students are proficient in math.

Class: Whoa!

Teacher: Yeah. That means given any problem, they know how to solve it.

Class: You sure?

Teacher: Yup. One of the methods that they use to help them solve problems is something called, "The Bar Model." That's something we're going to practice today, because when we were in data teams on Friday we looked over your math test and you're very good when I give you problems like this ... Almost a hundred percent of you would get problems like this, standard algorithm problems, correct. Where do you think we need to work on?

Class: Division.

Teacher: Division? But specifically, what type of division problems?

Class: Long division.

Teacher: Long division? Like this ...

Class: [crosstalk 00:07:56] Yeah.

Teacher: Long division?

Class: Oh, that's easy.

[00:08:00]
Teacher: Standard algorithm long division problems, or word problems?

Class: [crosstalk 00:08:06] Word problems! Yeah.

Teacher: Who thinks we need to work on word problems? Yeah. Okay, so that's what we're going to be doing today. I'm going to show you this Bar Model method, and this can be used for any kind of word problem. It doesn't matter what it is, addition, subtraction, multiplication, division, percentages, fractions, ratios, which we're going to do next module.

Class: What's a ratio?

Teacher: Don't worry about it. Any type of math computation problem that involves words, you can use this method. Now you're probably all wondering, "Teacher, what is this method you're talking about?"

Class: You're going to read it, though.

Teacher: I'm going to show you. I'm going to start it off with a multiplication problem because we're better at multiplication. We're going to do it together for a division problem, but I'm going to have you also practice it with Sal using unit conversions.

Class: Yay!

Teacher: We're going to practice it a couple ways. All right, so here's our multiplication problem, "Anna saved eight dollars every week for five weeks."

Class: Oh. Oh, yeah I see.

[00:10:00]
Teacher: "How much did she save all together?" Here's what we need to do first, we need to write our math statement. Our math statement comes from the question. What's the question we're being asked?

Class: What's eight ...

Teacher: What's the question we're being asked? Student?

Student: "How much money did Anna save in five weeks?"

Teacher: Okay, so how much did she save altogether? Altogether she saved ...

Class: Forty.

Teacher: Uh, we don't know yet. We haven't done the problem so we're going to leave a blank spot. I want you to write this on the bottom of your board. Take twenty seconds, write this on the bottom of your board. Just this statement, you don't have to write the problem it's already up here. Just this statement, "All together she saved," line. Don't forget to put your unit.

Class: [inaudible 00:11:18] ...

Teacher: [00:12:00] Okay, "Altogether she saved ... " I know you're done when your cap is on your pen, your board is in your lap or on the floor, and your eyes are on me ... Okay, ten, five, two, one. All right, so this is what we need to figure out. One of the other strategies that kids in Singapore use is they go through every single part of the problem. They kind of chunk it like how you would chunk reading, and they write down all of the important details. This is really, really helpful for when you have problems that are super, super, super long.

Let's start. Normally we would stop at a period, so we're going to stop at the period. However, if there's a lot of information in one sentence we're going to stop after important information. Let's start right there. "Anna saved eight dollars every week," stop. How much did she save every week?

Class: Eight dollars.

Teacher: This is where they get the term, "Bar model." We know how much she saved every week, so I'm going to draw a little rectangle. This is the amount of money she saved in

one week. "For five weeks," so how many weeks did she save eight dollars for?

Class: Five.

[00:14:00]
Teacher: Five, okay. Did she ever change the amount she saved?

Class: No.

Teacher: No, so I'm going to draw five rectangles that are all the same size, about. This is where they get the term, "Bar model," because you can see her one week, her single unit, right? We repeated it five times because she saved that much money for five weeks. "At the end of five weeks how much did she save?" Well, one unit is equal to eight dollars, five units is what we're looking for, so I'm going to multiple eight dollars times five. Eight dollars time five weeks is how much?

Class: Forty.

Teacher: Forty dollars, is that what you got?

Class: Yeah.

Teacher: Yeah? Okay, so let's answer our statement. All together she saved ...

Class: Forty.

Teacher: Forty dollars. Does this seem really, really hard to remember?

Class: [crosstalk 00:15:32] Yeah. No.

Teacher: Yes, no? Okay, your opinion. We're going to practice it. I don't expect you to master it by the end of today, no way you could possibly do that.

Class: I've already mastered it.

Teacher: [00:16:00] Okay, there's no way you could possibly master this by the end of today because you have no idea how this is used in each different kind of problem. This is how we would use it in multiplication. Addition might be something that looks a little bit similar because multiplication is just repeated addition. How would you use this in division? That's what we're going to test next.

All right, so we have another super saver on our hands, Mr. Ben. "Ben saved four hundred dollars in five weeks. How much did he save ... "

Class: Twenty dollars.

Teacher: Shh, excuse me. "How much did he save each week."

Class: [crosstalk 00:17:10].

Teacher: What is the question asking us to find out, Student?

Student: The question is asking us how much did he save each week.

Teacher: Yeah, so let's turn that into our math statement. "He saved," or, "Ben saved," do we know how much he saved?

Class: It's forty.

Teacher: Shh. Do we know how much he saved?

Class: No.

Teacher: No. Okay, so he saved a certain amount, we don't know, each week. Write that at the bottom of your ...

Class: Ben saved, we have no idea. Can we write, "He?"

[00:18:00]
Teacher: Sure. "Ben saved," some amount, we don't know yet, "Each week."

Class: [crosstalk 00:18:12] ...

Teacher: Ten.

Class: I got the answer.

Teacher: Two, one. All right, let's go through like how we did with the other problem and chunk it out to find the important information. Here's what we need to figure out, "How much did he save each week?" "Ben saved four hundred dollars," stop. How much did he save? Was this one weeks saving, or was this altogether over five weeks?

Class: Altogether.

Teacher: Altogether over five weeks. Let's use black ... Altogether over five weeks Ben saved four hundred dollars. What we need to figure out is, how much did he save each week? Do you think he saved the same amount each week?

Class: Yes.

[00:20:00]
Teacher: Yes? I can take my whole and divide it up into parts. How many parts would you divide it

up into?

Student: Five.

Teacher: Five? [Student 00:20:09], why do you say five?

Student: Because Ben saved, it's been five weeks.

Teacher: In five weeks, okay. One, two, three, four. Now we need to figure it out ... We know that five units, in this case a unit is a week, is equal to four hundred dollars. Well, to figure out one unit we would need to divide four hundred by five.

Class: What is the U for?

Teacher: Units.

Class: Oh, unit.

Teacher: Four hundred divided by five. Let's do long division way. Can five fit into four?

Class: No.

Teacher: No, let's extend it, make it forty. Can five fit into forty?

Class: Yes, eight times.

Teacher: Eight times.

Class: It's eighty.

Teacher: How much did he save each week?

Class: Eighty.

Teacher: Eighty what, goats?

Class: Dollars.

Teacher: Thank you.

Class: No, eighty elephants. [crosstalk 00:21:57] That's long division?

Teacher: Mm-hmm (affirmative).

[00:22:00]
Class: Oh, I thought it was supposed to be words.

Teacher: Okay. All right, are you ready to solve one with Sal?

Class: Yeah.

Teacher: Yeah? Okay.

Class: Who's Sal?

Teacher: His is going to be a little bit different because he is working with, instead of weeks and money, he's working with centimeters, meters.

Class: Oh, I see it. It's over there. [crosstalk 00:22:25][inaudible 00:22:27] ...

Teacher: [Student 00:22:39], can you just turn off the middle light? Yeah, there you go. Okay, I can only raise the volume up a little bit so if you want to hear we have to keep our mouths shut.

Sal: Thirty-seven centimeters, and we want to convert it to meters. We really just have to remind ourselves what the prefix, "Centi," means. "Centi," literally means one over a hundred, or one hundred of a meter. This is really saying thirty-seven hundredth meters, so let's try it that way. This is literally thirty-seven hundredths of a meter, so one hundredth meters. These are equivalent [tables 00:23:48].

[00:24:00] What are thirty-seven hundredths of a meter? Well, that's where you need thirty-seven hundredths of a meter. That's going to be thirty-seven hundredths of a meter, which can be rewritten as, if you wanted to write it as a decimal, that's zero point ... You could do this three-tenths and seven hundredths, or thirty-seven hundredths. Zero point three seven meters.

Another way that you could of gone about this is, "Look, I'm going to go from centimeters to meters. I need a hundred centimeters to get to one meter-

Teacher: Okay, I'm going to pause it right there. I know we already know the answer, but I want to see if we can show what he did using the Bar Model. The reason I let it run through is because it reminded you how many centimeters are in one meter. It says, "Convert thirty-seven centimeters to meters." It's not really a question, it's not shaped like a question, but it kind of is. How would you write the math statement? How would you write a math statement, Student?

Student: I would put thirty-seven [times 00:25:24] a hundred.

Teacher: Remember the math statement is the answer to our question.

Class: Yes.

Teacher: Okay. Basically what he's asking is, "How many meters are in thirty-seven centimeters?" How would you rephrase that as a statement, [Student 00:25:45]?

Student: Thirty-seven centimeters is the same as [inaudible 00:25:49].

[00:26:00]
Teacher: "Thirty-seven centimeters," I'm just going to put the abbreviation, "Is equal to," we don't know how many meters, yet. I mean, we know because Sal solved it already but if we hadn't watched him solve it we wouldn't know.

Class: I'd know.

Teacher: Thirty-seven centimeters is equal to some number of meters, we don't know how many yet. Here's what we do know. Centi is, he said, "One over a hundred." If you broke your unit up into a hundred pieces, one centimeter would be one of those little pieces. Here's our unit. This is one meter or one hundred centimeters. What we want to know is, what part of this meter equals thirty-seven centimeters? ...

[00:28:00] No, I have that backwards. ... No, wait a minute. Yeah ... Okay. One meter is equal to ... No, this is not right. One meter is equal to one hundred centimeters. One hundred centimeters times thirty-seven, we get point three seven. I know I'm doing this wrong, in my head it makes sense, but this is probably wrong. Wait, what did he do? ... Ah, that's why! Okay, so thirty-seven centimeters is equal to thirty-seven hundredths of a meter. Is it a full meter?

Class: No.

Teacher: No, it's not a full meter because we need one hundred of those in order to be a full meter. We didn't have a hundred, we only had thirty-seven. Thirty-seven out of a hundred. I'm hoping the next video I show you will help you kind of remember the prefixes, because it's not just centimeters we're going to be working with. We're going
[00:30:00] to be working with millimeters, hectometers, all of that.

Class: [crosstalk 00:30:07][inaudible 00:30:07] ...

Video: You know, I figured out how to memorize [inaudible 00:30:32]. It's all based on the powers on [inaudible 00:30:35]. You just need to memorize a couple Latin prefixes and then you can measure anything. Just remember King Henry. Oh, you don't know about King Henry.

Class: I remember this!

[00:32:00]
Video: (Music and singing) ... ...

Class: [crosstalk 00:32:20] We'll probably see it again before [inaudible 00:32:25].

Teacher: Okay, so if I were to ask you if we're dealing with meters, measuring length, which would be longer a kilometer or a decimeter?

Class: [crosstalk 00:32:56] Kilometer.

Teacher: Student, what do you think would be longer a kilometer or a decimeter?

Student: A kilometer.

Teacher: Which one?

Student: A kilometer.

Teacher: Kilometer? Do you agree?

Class: [crosstalk 00:33:14] Maybe, yes, kind of. Yes, I agree.

Teacher: [00:34:00] Yeah? Okay, because the meter is our base. If we had meters, six meters, would be six meters. Six kilometers would be six thousand meters. That would probably be from here to Jack in the Box, pretty far. If we had six centimeters, centimeters are tiny. Centi, right? Deci, centi, milli, those are fractions of your whole unit: meter. Not even a whole unit but like a small piece of it. If I had deciliters and hectometers, which would be more, [Student 00:34:28]? Deciliters or hectometers?

Student: Hectometers.

Teacher: Yeah, why?

Student: Because it says one hundred, it's a hundred on the bottom.

Teacher: Like a fraction?

Student: Yeah.

Teacher: This is not even a full meter?

Student: Oh, no. I don't know.

Teacher: Student, what do you think? Is he right, hectometer?

Student: Yeah.

Teacher: Why?

Student: Because a hectometer is one meter times a hundred, but a deciliter is one hundred time

ten.

Teacher: Yeah, so this is ten times bigger, this is a hundred times bigger, this is a thousand times bigger. Or, this is ten times bigger than a deciliter, this is one hundred times bigger than a deciliter.

Class: What is a base?

Teacher: The base is your main unit, so liter, meter ...

Class: Kilo?

Teacher: No, what else do they measure?

Class: What about centi?

Teacher: [00:36:00] Centimeter. [Student 00:35:51], brings up a good point. What about gallon? Do we have deci-gallons, kilo-gallons? No, so this is only used with metric measurements ... Leave the board on the floor, please. This is only used with metric measurements. We don't use this for our inches, feet, yards, gallons. This is just a way to break things down more. A kilometer might be about the same length as a couple of miles. They break it down in base ten, we don't. We have gallons, quarts, pints. Remember gallon man?

Class: Yeah.

Teacher: Yeah? Okay. All right, here's what I'm going to have you guys do next. I want you to work on problem solving number four. There are six problems, some of them are division, some of them are working with units. Use the bar model method to help you. Now, there might not be enough room on the bottom of this but you can use the back, you can use scratch paper. No, you may not use the board because you can't staple the board to the back of this. I will leave this up here so you can remember.

Class: Yay!

Teacher: [00:38:00] "King Henry Died Drinking Chocolate Milk." If you had a base unit of meters and it said, "How many decimeters were in six meters?" This is what you do, multiply it by ten. If it said I had centimeters, this is what you do, divide it by a hundred. I will work with a few of you but the rest of you I want you to try it on your own, because I want to see for tomorrow, "Do we have to go over the bar method again?" I know we have to, but what about it do we have to review?

Oh, scouts. Let's check in with you before you head off. Who did you see exhibiting good behavior?

Student: I saw Student [inaudible 00:38:55].

Teacher: Okay, why? Why was she exhibiting good behavior.

Student: Instead of playing around she was listening to you while you were teaching.

Teacher: Okay, anybody else?

Student: I saw [Student 00:39:24] being a self-directed learner.

Teacher: Okay, why? Why was she being a self-directed learner?

Student: [inaudible 00:39:37] doing good and she was paying attention to the [inaudible 00:39:41].

Teacher: Okay, thank you. Student?

Student: I saw [Student 00:39:45] being [inaudible 00:39:48].

[00:40:00]
Teacher: Okay, thank you. Pass that to [Student 00:39:57], please. Anybody else?

Student: I saw [Student 00:40:04][inaudible 00:40:04] because she wasn't talking to the people in the class.

Teacher: Okay.

Student: She wasn't talking during the problem.

Teacher: Okay, very good. Thank you. Yes, I saw them too. All right, before recess I'll check in with you guys again, so you still have a chance to win dolphin tickets. Dolphin store is next week, Monday.

Class: [crosstalk 00:40:30] What?

Teacher: I'll check. Okay, can I have from [Student's 00:40:44] and [Student 00:40:45] stand up, go back to your seats?

Class: [crosstalk 00:40:49] How could he die from chocolate? Because he keep on drinking it, like a lot of sugar or sodium ...

Teacher: The rest of you, stand up. Can I see Student, [Student 00:41:20], Student, and [Student 00:41:27] down on the floor?

Class: No!

Teacher: Yes.

Class: I need help.

Teacher: I will help. I want to help these guys first. If I did not call your name please stay at your seats, you can get started.

[00:42:00]
Class: [crosstalk 00:41:47] ... ...

Teacher: Hold on to it. Can you write [inaudible 00:42:11] name on one of them, please? Thank you.

Class: [crosstalk 00:42:14] ...

Teacher: Okay, I will be calling more people down, so if you need help you need to at least start ... Come.

Student: We'll need a pencil?

Teacher: Yes.

Student: Oh.

Class: Is that a [inaudible 00:42:44]?

Teacher: Yes.

Class: [crosstalk 00:42:49] ... What is today?

Teacher: The sixteenth ... Student, come closer. Thank you.

Class: Is today the sixteenth?

Teacher: Yes, today is the sixteenth.

Class: [crosstalk 00:43:17] ...

Teacher: Okay, let's start with A. "Three families are vacationing together. They are equally sharing the hotel cost, which is two thousand six hundred thirty-four dollars. Manuel's
[00:44:00] family is also renting a car for three hundred and forty-eight dollars. How much will Manuel's family have to pay for the car rental and the hotel together?"

Student: You have to add it.

Teacher: Okay, so let's break this down. What is the question asking us to do? Let's write our math statement first. [Student 00:44:26], what do you think our math statement's going to be?

Student: Oh, I thought you were asking what the question was.

Teacher: Well, yeah. What is the question?

Student: How much will Manuel's family have to pay for the car rental and the hotel?

Teacher: Okay, so how would you change that into a statement.

Student: The Manuel family has ...

Teacher: So, "Manuel's family will pay ... "

Student: Blank.

Teacher: Okay. "For ... "

Student: The car rental and the hotel.

Teacher: All right, so let's go through each part of the question. "Three families are vacationing together," stop. How many families are we dealing with?

Student: Three.

Student: Three.

Teacher: Three ... Oh, wait a minute, that's not right. Okay, three families. "They are equally sharing the hotel cost, which is two thousand six hundred thirty-four dollars," stop. How much was the hotel?

Student: I know!

[00:46:00]
Teacher: Careful. How much was the hotel, Student?

Student: Two thousand six hundred thirty-four dollars.

Teacher: Okay, and is that how much one family is paying?

Student: No.

Student: No.

Student: No, it's how much all of them.

Teacher: Oh, that's how much all of them are paying. Okay, so I'm going to start drawing the bars.

All of them are paying two thousand six hundred thirty-four dollars. "Manuel's family is also renting a car for three hundred and forty-eight dollars," so they have an added cost of a car. How much is that car?

Student: Three hundred and forty-eight dollars.

Teacher: Okay, three hundred and forty-eight dollars. I'm going to write that up there for now. This is just for Manuel's family, so I just wrote that up there to remind myself. We said this hotel money, they're equally sharing it. All three families are equally sharing this amount. If three families are sharing this amount, how do we figure out what one family is paying, [Student 00:47:47]?

Student: You divide.

Teacher: Okay, so what am I going to divide?

Student: You're going to divide two thousand six hundred thirty-four dollars divided by three.

Teacher: Why by three?

[00:48:00]
Student: Because there's three families and they're sharing the two thousand six hundred thirty-four dollars.

Teacher: Good. Let's do standard algorithm because we need practice with that. Three cannot fit into two, so let's make it twenty-six.

Student: [inaudible 00:48:39].

Teacher: Yeah, that's what we're doing.

Student: Can we do it in short?

Teacher: Each number at a time. You cannot divide two things among three people evenly. Yeah, so we have to make it twenty-six. Three can fit into twenty-six ... We can get something close.

Student: Twenty-four.

Teacher: Yeah, so how do we get to twenty-four? Three times what gives me twenty-four?

Student: Eight.

Student: Eight.

Student: Eight.

Student: Eight.

Teacher: Eight, okay. Three times eight is twenty-four. Now we have twenty-three. Well, obviously we can't use eight because eight gave us twenty-four, so let's do one number down. Times ... One number below eight ...

Student: Four.

Teacher: One number below eight.

Student: Seven.

Teacher: Yes. Three times seven is how much?

Student: Twenty-one.

Student: Twenty-one.

Teacher: Three can fit into twenty-four evenly?

[00:50:00]
Student: Yes, by eight.

Teacher: Eight times three is twenty-four, yup. How much is each family paying for their hotel?

Student: Eight hundred and seventy-eight dollars.

Teacher: Okay, but is that what our question's asking?

Student: No.

Teacher: No? No, it's not. There's one more step we have to take because we're talking about Manuel's family. What was the other step we had to take, Student?

Student: You have to add how much they have to pay for the car rental and how much they have to pay for the hotel.

Teacher: Yeah, so Manuel's family, theirs actually looks like this because we have eight hundred and seventy-eight for the hotel, and three hundred and forty-eight for the car ...

Student: I got one thousand two hundred and twenty-six ... I got one-two-two-six.

Student: Yeah, you already said it.

Teacher: Okay, so Manuel's family will pay how much for the car and the hotel?

Student: One thousand two hundred and twenty-six.

Student: One thousand two hundred and twenty-six.

Teacher: Okay ... Oops, what am I thinking? Okay, for his car and his hotel. All right ... Is it easier to see what to do when you draw out the bar like this?

Student: Yeah.

[00:52:00]
Teacher: Yeah? Because then you can see, right? You need to divide it up into three pieces, they're all equal, this is actually Manuel's families money, how much they're paying ... Do you think you can do the rest of the problems on your own?

Student: Yes.

Teacher: Yeah? Do you want to do a practice conversion problem?

Student: What, there's those problems too?

Teacher: Yeah, the very last one.

Student: What the ...

Student: Can we try and do B and try and get the answer, and then you check it or something?

Teacher: B? You want to do B?

Student: Yeah, we do it [inaudible 00:52:51].

Teacher: Well, at the end, before we go to recess, I'm hoping that I can bring everybody back and talk to them about it.

Student: Can we do F?

Teacher: You want to do F? Okay, girls do you want to do F or do you think you're confident doing it by yourself?

Student: [inaudible 00:53:09].

Teacher: You want to do F? Okay, we'll do F.

Student: Is that the only problems [inaudible 00:53:20]?

Teacher: No. D, E, and F are both working with measurement.

Student: The last three?

Teacher: Mm-hmm (affirmative), but we'll do F together. "In 1990 the Olympic marathon distance was forty point two six kilometers, and in 1906 is was forty-one point eight six kilometers. Then in 1924 the distance was fixed at forty-two point one nine five
[00:54:00] kilometers. How many more meters is the current marathon distance than the 1900 distance?" What's the question asking us to find out, what's our math statement?

Student: How many more-

Teacher: Remember statement, not question. Statement. [Student 00:54:19]?

Student: Length meters was ...

Teacher: "The current marathon ... "

Student: Distance is ...

Teacher: Mm-hmm (affirmative), "Is," blank, "Meters," longer or shorter?

Student: Longer.

Teacher: Okay, "Than the 1900 distance." So, "The current marathon distance is some meter longer than the 1900 distance." So, "In 1990 the Olympic marathon distance was forty point two six kilometers." ... Oh, I'm sorry, not 1990, 1900. So, in 1900. "In 1906 it was forty-one point eight six," am I going to make my bar longer than this one or shorter than this one?

Student: Shorter.

Student: Shorter.

Teacher: Forty-one point ...

Student: Oh, no. Longer, longer.

Teacher: Longer, okay. Remember, I'm not making it the same size, I'm going to make it a little bit
[00:56:00] longer because it was a little bit longer. Forty-one point eight six, and this was in 1906. 1924, it was raised to forty-two point one nine five, so am I going to make it longer, equal, or shorter?

Student: Longer.

Student: Longer.

Student: Longer.

Teacher: Longer. In 1924 it was raised to forty-two point one nine five kilometers. "The current marathon distance," so this is the current marathon distance, "Is blank meters longer than the 1900 distance." Did it talk about the 1906 one at all in our question?

Student: No.

Teacher: No, so we don't need to concern ourselves with this one. This one, out. Don't worry about it. The only thing the question is asking us to compare is the one from 1924 to the one in 1900. How much longer was this one, compared to that one? What operation do you think we would use?

Student: Subtract.

Teacher: You're going to subtract? Yeah, because I need to know if I were to make this the same, what is this piece? Here's what I need to find out ...

Student: Can we erase the 1906?

[00:58:00]
Teacher: Huh? Yeah. Here's what I need to find out ... What's the first thing you would do when you're subtracting these two decimals? Add a ...

Student: Zero.

Teacher: Okay. Does that change the value of forty point two six?

Student: No.

Teacher: No, all it does is it allows me to subtract this a little bit easier. Five take away nothing is going to be five, nine take away six ...

Student: Three.

Teacher: One take away two?

Student: Cannot.

Teacher: Cannot, so I need to regroup. I'm going to take from here and put over here. Eleven take away two?

Student: Nine.

Teacher: One take away nothing?

Student: One.

Teacher: Four take away four?

Student: Zero.

Student: The answer is ...

Teacher: The answer is: this marathon is one point nine three five, or one and nine hundred thirty-five thousandths of a kilometer, longer. Somebody want to check it? How would you check it, Student?

Student: You add the answer you got with the forty point twenty-six.

Teacher: Yup.

[01:00:00]
Student: To see if you get forty-two point [inaudible 01:00:01].

Teacher: Okay.

Student: Got it.

Teacher: Did you check it, is that what we got? Yeah? Okay.

Student: Yeah.