AUDREY MILES: Remember your spots on the carpet, please. Yeah. Hold on. One second. Let me get my instructions first. Good morning, boys and girls!

STUDENTS: Good morning, Ms. Miles.

AUDREY MILES: Did you have a good recess?

STUDENTS: Yes.

AUDREY MILES: Okay, so you know we're going to be doing the Problem of the Month. We're going to start our new Problem of the Month. And so, yesterday what we did was, we introduced the vocabulary. Okay. So, we talked about what it means to have a party. Okay? And so, Marissa said it's when you invite your family, and Canisha said it's when you invite people over to your house. Carlos said you invite people. Amari said you invite people, three or more friends. And Kyla said it's when you have a cupcake party, a themed party. Elaina said it's when you invite your cousins. Maddie says it's when you dress up with your friends. And Astor said it's when you have fun. And Denison said it's when you have a cake and you invite your family. And Gabriel said you invite friends to go somewhere with you. So, we circled all the words, and the big word was, what? IN-VITE.

STUDENTS: Invite.

AUDREY MILES: And invite means what?

STUDENTS: Come.

AUDREY MILES: Come. Okay? So, we're going to do a party today. We're going to talk about a party today in our math problem, and we're going to remember to use our signals. Okay? And to read, we're going to use our quiet hands. Show me a quiet hand, please. And when we do a quiet hand, we do what?

STUDENTS: Raise your hand and wait to be called on.

AUDREY MILES: Okay, so are we going to have any yelling out?

STUDENTS: No.

AUDREY MILES: No. So, right now your hand is?

STUDENTS: In your lap.

AUDREY MILES: Okay, all right. So, let's just get started. So, on our party, we're going to talk about today, we're going to talk about a young lady who's having a party. And this young lady's name is Cindy. Cindy's having a party, and her mother told her that she can invite some friends. So, Cindy invites her friend, hmm, I'm going to use your name, Amari. And Amari and -- Cindy also invites, let's see, she invites Shamara. Okay. I'm just going to put that right there. Shamara.

STUDENT: Two people.

AUDREY MILES: Yeah, we have a boy and a girl. So, Cindy invites Amari -- shh, raise your hand. So, how many people do we have so far?

STUDENTS: Three.

AUDREY MILES: Three. Okay. So, now we're going to talk about each one of her friends are going to invite some guests. Each one of her friends are going to invite some guests. Okay. The number of friends that she gets to invite are three. Three. So, let's see. Amari, which friends do you want to invite?

STUDENT: Gabriel.

AUDREY MILES: You would invite Gabriel, you said. Okay, so we're going to invite Gabriel. That's one. And what other friends do you want to invite?

STUDENT: Um, Denison.

AUDREY MILES: Denison.

STUDENT: And Bree.

STUDENT: Aw, man. I knew he was going to say that.

AUDREY MILES: It's okay if he invites all boys, because that means Shamara can invite all the --

STUDENTS: Girls.

AUDREY MILES: Okay. And you get one more. Amari. Oops. No, I did say three, didn't I? Bad teacher. Okay. All right, Shamara, you get to invite three friends.

STUDENT: I'm going to invite Elaina.

AUDREY MILES: Elaina. And who else do you want to invite?

STUDENT: I want to invite Maddie.

AUDREY MILES: You want to invite Maddie. Okay. And who else do you want to invite?

STUDENT: Marissa.

AUDREY MILES: Marissa. Okay, now.

STUDENT: You forgot me.

AUDREY MILES: No. I didn't forget you. So, now let's look at -- I want to know, how many people do I have in all at my party now? I want to know, how many people do I have in all? And -- you're not going to tell me. You're going to turn and talk. You're going to turn and talk. And you're going to talk to your partner, and I want you to come up and -- and you're going to be able to explain how you got your answer. Turn and talk. Turn and talk. Find your partner. Carlos.

STUDENT: There's four.

AUDREY MILES: There's four. Did you count them all?

STUDENT: Mm-hmm.

AUDREY MILES: Did you count them? Look and see.

STUDENT: All of them?

AUDREY MILES: Yes. Cindy, and then who else do we have?

STUDENT: [inaudible]

AUDREY MILES: Count how many there are.

STUDENT: Altogether?

AUDREY MILES: Yeah. Don't tell me. Talk to your partner. How many do you have altogether?

Three. And two. And one. Now before you tell me, and he'll have an opportunity to come when he acts right. Five, four, three, two, one. Okay. I'm going to give you some cubes, and we're going to build this. And I'm going to show you how I want you to build it. I want you to pull out the cubes and pull out the amount that we have here. So, we're going to figure out how many we have together. So, each person's going to get a set of cubes. And you may work with your partner. Maddie, I need [inaudible]. I'm going to explain in a minute, Maddie.

Okay, so how many people did I start off with?

STUDENT: Four.

AUDREY MILES: How many did I start off with?

STUDENTS: Three.

AUDREY MILES: What did I start off with, guys?

STUDENTS: Yellow.

AUDREY MILES: We started off with Cindy. Okay. And Cindy is going to invite people. Okay, so we're going to build that piece first. So, I need you to watch me. Watch me. I don't see eyes on me. One, two, three. Eyes on me. I did not say, "Play with the cubes." Start off with one. Let me see one in the air. That's all I need, is one. Thank you. Now, this was Amari and that was Shamara. Okay. So, Amari and Shamara, this is what we're going to build. Shamara and Amari. So, you're going to match me. Watch. One. And how many am I going to add?

STUDENTS: Two.

AUDREY MILES: Okay, so I'm going to add that. So, I need to see you to build this -- without talking, please. And when you have it, hold it up. And don't show me talking. When you have it,

show me with your thumbs up. Dominic. Ms. Thornley, you can help Dominic. Dominic, do you see me? Let me see. I can see that you did it. Just show me. We're waiting -- we're still waiting on a couple of people. Shh. I can't start until I see everyone's ready. Okay. Next. Let me see. We're waiting on one more person. Amari, you didn't get cubes? Okay. All right. Next, how many people did I add here?

STUDENTS: Three.

AUDREY MILES: Three. So, here's one, two -- Okay, so, so far, how many do I have here? Let's go back here. How many do I have here? How many are here?

STUDENTS: Three.

AUDREY MILES: So, now Cindy invited Amari, and Amari -- and she also invited Shamara. So, now there are three people at my party. Three people at my party. So, now Amari's going to invite his three people. So, we're going to add the three people to Amari's side. So, I need you to model -- I'm going to show you. How many people am I going to add to Amari's side, everybody?

STUDENTS: Three.

AUDREY MILES: How many?

STUDENTS: Three.

AUDREY MILES: So, I need you to add three people, three persons, to Amari's side. It'd be nice if I put the cubes together, Ms. Miles. Watch me. Shh. Take the three and connect. Amari is going to invite three people. So, add three. Connect the three together, and then connect them. Let me see you model this. How many am I adding to this side? Three.

STUDENT: Aw, man.

AUDREY MILES: Just keep trying. When you're ready, hold it up and show me your thumbs up. Good job. Okay. So, can we count how many we have now? Let's -- shh. Let's see. We're still waiting on Shannon. Did you add three? You added three. You did. You didn't add it to the one side? Give me one more. Now hold onto it. Shh. Canisha, I need you to add that the way I asked you to add it, please. Look at mine. Make sure it looks like mine.

STUDENT: Like this?

SPEAKER: Ms. Miles, who's that -- who's that fun piece sticking out the side there?

AUDREY MILES: Mm-hmm. That's Cindy. Cindy.

SPEAKER: That's Cindy sticking out.

AUDREY MILES: Nope. Actually, Cindy -- I'm sorry. Go back, Ms. Miles. This is Cindy. This is Amari, and this is Shamara. Does Shamara have guests yet? Have I added Shamara's guests yet?

STUDENTS: No.

AUDREY MILES: No. So, this is Shamara over here. Thank you. Okay. Does everybody have Shamara sticking out over here by herself?

Okay, so let's count how many we have now. Let's start at the top. Ready. I need you -- I need you back with me. Ready. Shamara, we're not doing that. Ready. Get ready to count. Go.

One, two, three, four, five, six. How many do we have -- how many guests do we have now?

STUDENTS: Six.

AUDREY MILES: Six. So, with Amari and his guests, there are six. Okay. Now, let's add Shamara's guests. How many guests did Shamara have?

STUDENTS: Three.

AUDREY MILES: Three. Okay. So, go ahead and add three to Shamara's side. This is where -- You're going to add it right here. This is right here. So, I'm going to add three.

STUDENT: No.

AUDREY MILES: So, now I look like this. Let me see you model that.

STUDENTS: How do you do it?

AUDREY MILES: Add three.

STUDENT: [Inaudible]

AUDREY MILES: Give me three. Let me see. Add three. Add three. Add three. Put it up here. Two more. Okay, now turn --

SPEAKER: How many do I have there?

AUDREY MILES: Hello. The last one on there. Okay, now you get the opportunity to turn and talk to your partner. Five, four, three, two, one. I need you to turn, talk to your partner, and see if yours looks like your partners. Turn and talk to your partner. I need you to work with your partner. Astaire is your partner. Come on. I knew you and --

STUDENT: [Inaudible]

AUDREY MILES: Did you add -- How many do you have? Does yours look like mine? Does yours look like mine? It looks like you have to … Do you have the same amount I have or you have more or less?

STUDENT: Less.

AUDREY MILES: You have -- Do I have more, or do you have more?

STUDENT: More.

AUDREY MILES: Okay, so is yours correct?

STUDENT: Yes.

AUDREY MILES: Okay, then you need to fix it. Okay, look at yours --

SPEAKER: Why don't you just take a minute and count how many blocks you have. What -- no matter how well they're organized right now --

AUDREY MILES: I need you to compare with your partner.

SPEAKER: How many blocks do you have compared to your partner?

AUDREY MILES: Compare it with your partner. Very good, Maddie. Mm-hmm. Five, four, three, two, and one. Come back. Come back. Come back. Okay, I need you to put your cubes in your … Before -- for this last piece I'm going to do, let's count how many we should have before we start. Five, four, three, two, one. I need you. Show me you're ready. Let's go. Let's count how many we should have. And I need you to match me if yours doesn't match. Ready? Go. One ...

STUDENTS: Two, three, four, five, six, seven, eight, nine.

AUDREY MILES: So, how many guests are there altogether at the party?

STUDENTS: Nine.

AUDREY MILES: Let's see if that matches what we have here. Let's count. Go. Ready? Go. One ...

STUDENTS: Two, three, four, five, six, seven, eight, nine.

AUDREY MILES: Okay, this is our first day, so we're going to do this a whole bunch of times until we get it perfect.

TRACY LEWIS: So, Cindy was having a ...?

STUDENTS: Party.

TRACY LEWIS: And what did she do? One person.

STUDENT: Invited guests?

TRACY LEWIS: She invited guests, and we were trying to figure out what? What were we trying to figure out? Who remembers? Shawani?

STUDENT: How many people were at the party.

TRACY LEWIS: How many people were actually at the party. And so the last time you all worked on this, we stopped and we came up with, possible answers were 9, 18, 22, 35, 11, 16, and 17. So some answers are more accurate than others. Today you're going to get an opportunity to work on it, because how many people finished? Or how many people didn't finish?

STUDENT: I don't remember.

TRACY LEWIS: You don't remember or you're not sure? Okay.

STUDENT: I didn't finish.

TRACY LEWIS: So, before you go back to your work, what are some things that mathematicians look for? What do mathematicians always look for? Because we do want to figure out how many people Cindy actually invited to this party. So, when someone gets your work and they pick it up, how are they going to know what it is you're thinking? What are mathematicians going to look for? Giovanni?

STUDENT: They look for evidence.

TRACY LEWIS: They're looking for evidence. What kind of evidence? What kind of evidence? I mean, are they going to look for fingerprints?

STUDENTS: No.

TRACY LEWIS: No, are they going to find an apple on your paper?

STUDENTS: No.

TRACY LEWIS: What kind of evidence are they going to find? Erin?

STUDENT: Pictures?

TRACY LEWIS: Some pictures. Shawani?

STUDENT: Words.

TRACY LEWIS: Some words. Dewan?

STUDENT: And numbers.

TRACY LEWIS: And some numbers. What kind of numbers? What kind of numbers? Yes?

STUDENT: Labels.

TRACY LEWIS: Maybe some labels. Some numbers, some pictures, some words. Diamond?

STUDENT: A number sentence.

TRACY LEWIS: Maybe they'll find a number sentence. Victoria?

STUDENT: They'll find probably like, something like an answer to the what you're looking for.

TRACY LEWIS: They'll find an answer to what it is we're trying to figure out. So today you're going to get an opportunity to finish that up. When you are done with that, Ms. Lewis has a new challenge for you. Are you ready?

STUDENTS: Yes.

TRACY LEWIS: All right. So, what I'm going to do is I'm actually going to hand you out what I'm going to read to you. And this is what you're going to work on. And then, we're going to get started on it. There we go. So, I want you to take one, that's right, take one and pass it. Thank you. Take one and pass it, in the back. No, just pass it straight down. Good job, thank you, London.

That's excellent, I hear one person starting to look at the problem. They're trying to figure it out, or just see what the words are. Raise your hand if you don't have one. Thank you for waiting patiently.

Okay, everybody has one. Let's start at the top. What's the title on the page?

STUDENTS: Level C.

TRACY LEWIS: Okay, let's read it together.

TEACHER AND STUDENTS: Mia, Jake, Carol, Barbara, Ford, and Jeff are all going to a costume party. Figure out which person is wearing what costume and when they arrived at the party.

TRACY LEWIS: Oh, now stop. That is the scenario. That's what's going on. We're supposed to figure out who's coming to the party, and what costume they were wearing, and what order they came in. So, let's find -- we're going to read on and find out some clues. Here are out clues. Let's go, let's start with the first one.

TEACHER AND STUDENTS: The person that arrives fourth was wearing the bathing suit. Barbara was the last to arrive. Jake and Mia arrived and stayed together. The first person was

dressed as a French maid. Superman arrived right before Barbara. The Potato Heads were always together at the party. Ford was a surfer dude. The French maid was not Carol. The vampire arrived after Superman.

TRACY LEWIS: Wow. Was that a lot of clues?

STUDENTS: Yes.

TRACY LEWIS: Okay. What do you think the first thing we can do to figure this out? First of all, do you remember what we're supposed to figure out? What are we trying to figure out? Sarah, what are we trying to figure out?

STUDENT: The order they came in. What they were wearing. And who was who.

TRACY LEWIS: And who was who. The order they came in. And what they were wearing. What information do we know for sure? Can you figure that out? What information do we know for sure. Isaiah?

STUDENT: That the Potato Heads was all together, always together.

TRACY LEWIS: The Potato Heads were always together. They were always together. So, what do you think that means? If we're supposed to figure out the order, and the Potato Heads were always together. You think that means something? You think that's important? Kinda, sorta, not sure yet? Okay. Victoria, what do we know for sure?

STUDENT: I know that I looked on line three.

TRACY LEWIS: Mm-hmm.

STUDENT: And I saw "Jake and Mia arrived and stayed together," so I think that the Potato Heads can be like Jake and Mia.

TRACY LEWIS: You think that -- why do you think that?

STUDENT: Because they said, "The potato heads were always together at the party," and "Jake and Mia arrived and stayed together."

TRACY LEWIS: Oh. They arrived and stayed together. So, what words let you know that that was Jake and Mia? Are there some clue words in there?

STUDENT: Yes.

TRACY LEWIS: What are the clue words?

STUDENT: Stayed together.

TRACY LEWIS: Stayed together. Are there clue words in the other one?

STUDENT: Um.

TRACY LEWIS: So, everybody look on line 3. She said she's looking at line 3, it says "Jake and Mia arrived and stayed together."

STUDENT: It says “always together.”

TRACY LEWIS: Oh, stay together and always together. Okay, that's a clue.

STUDENT: And they both had “together.”

TRACY LEWIS: Okay. Sarah, I'm going to give you an opportunity to share with the whole group, and then I want you to talk to your partner, or someone that's close to you, to see what else -- what other information do we know for sure. Sarah, what did you want to share?

STUDENT: I think the, the person who arrived fourth, who was wearing a bathing suit -- bathing suit, was Ford because he was a surfer dude and surfer dudes usually wear bathing suits.

TRACY LEWIS: Oh, okay. So, you're using some information that you already know. You know something, how many of you have seen a surfer before? Kind of doing this thing. Are they wearing a suit?

STUDENTS: Yes.

TRACY LEWIS: They're wearing a suit? Like a suit and a tie?

STUDENTS: No.

TRACY LEWIS: Are they wearing a school uniform?

STUDENTS: No.

TRACY LEWIS: No, they're wearing a ...

TEACHER and STUDENT: Bathing suit.

TRACY LEWIS: So -- Or, okay, so you're thinking that Ford was the surfer dude. Is that what you said?

STUDENT: No. Ford -- we know Ford is the surfer dude.

TRACY LEWIS: Oh, you know. You know Ford was the surfer dude.

STUDENT: Which means he's the fourth person.

TRACY LEWIS: Ah, okay. So, I want you to take a minute and talk with someone who is next to you about the information that we know for sure. What do we know for sure? Go ahead.

STUDENT: The information that we know for sure is that they were going to a costume party.

STUDENT: The first person was dressed as a French maid.

STUDENT: So that's what we know for sure.

STUDENT: Well I think, it's the two Potato Heads, that's what I think.

STUDENT: So, Jake and Mia, you think they're the two Potato Heads?

STUDENT: Yes, I do.

STUDENT: And the Potato Heads were always together at the party. So, Barbara was the Potato Heads.

STUDENT: Wait, where?

STUDENT: Barbara --

STUDENT: Superman. That's what it says, Superman.

STUDENT: Yeah, so Superman arrived right before Barbara. So that means Barbara was the Potato Heads.

STUDENT: Yeah, and I think um, what's her name? Mia was the um, was the Potato Head with Jake. That's what I think.

TRACY LEWIS: One, eyes up please. Okay, so we've been using a lot of words. I've been listening to some friends share. You've been listening to some friends share. We have some paper right here that has some words on it. So, that's one way of learning. What happens if we actually do what we did for the first problem? Do you remember what we did for the first problem? For Cindy's birthday party? Or -- what did we do, Isaiah? Do you remember?

STUDENT: We tried to figure out how many people was at the party.

TRACY LEWIS: We did, but how did we do it? We did it on paper, and we did it another way, where we had something happening over here. What else did we do?

STUDENT: We placed people on, on top of the tables.

TRACY LEWIS: Right, so one person actually got to be Cindy, and actually invited two friends, and we actually acted it out. Do you think it would help if we tried to act this out?

STUDENTS: Yes.

TRACY LEWIS: Okay. Let's try to act it out with what we know for sure. What do we know for sure?

TRACY LEWIS: Do you remember what we did for the first problem? For Cindy's birthday party? Or what did we do, Isaiah? Do you remember?

STUDENT: We tried to figure out how many people was at the party?

TRACY LEWIS: We did, but how did we do it? We did it on paper and we did it another way where we had something happening over here. What else did we do, Harinder?

STUDENT: We fixed people on top of the tables.

TRACY LEWIS: Right. So one person actually got to be Cindy and actually invited two friends and we actually acted it out. Do you think it would help if we try to act this out?

STUDENTS: Yes.

TRACY LEWIS: Okay, let's try to act it out with what we know for sure. What do we know for sure? Are we going to use everybody?

STUDENTS: No.

TRACY LEWIS: No. How many people do we need? How many actors do we need? How many actors do we need? What's something else that we know for sure, Dewan?

STUDENT: Six. We need six actors.

TRACY LEWIS: We need six actors. So, all right. Kellan.

STUDENT: Yes?

TRACY LEWIS: Kellan, pick a friend.

STUDENT: Uhh, Giovanni.

TRACY LEWIS: Okay, Giovanni. Can you do me a favor and go stand in the middle where we usually line up? Giovanni, pick a friend that's a girl.

STUDENT: Oh. Uhh, Nia.

TRACY LEWIS: Okay. DeAngelo and Shanice. Well, do you think we should use this? Use some information here?

STUDENTS: Yes.

TRACY LEWIS: Because Ms. Lewis was trying to be fair, but --

STUDENT: That's five.

TRACY LEWIS: That's five people? Well, let's see.

STUDENT: I could choose.

TRACY LEWIS: Remember, you're actors. You're actors. So where are my actors? My actors need to be over here where I can see you. One, two, three, four, five. You were the last person?

STUDENT: No. Six.

STUDENT: One, two, three, four, five, uhh. Guessing … Sarah.

TRACY LEWIS: Sarah. I was going to say Sarah.

STUDENT: It's too many --

TRACY LEWIS: Now six. Okay. But they are actors. So right now, are they in the right order? Can you guys move over? Move down so everybody can see. There you go. Are they in the right order? So, so far what we know is that they all came to the party and --

STUDENT: They all were wearing costumes.

TRACY LEWIS: They all were wearing costumes. Okay. Kellan, I see you're trying to organize people. What are you doing?

STUDENT: Try to put it in the right order.

TRACY LEWIS: Well we're going to figure out the right order. We've got to figure out who walked through the -- who walked through the door.

STUDENT: He's sequencing.

TRACY LEWIS: He's sequencing. Very good word. All right, let's see, what do we know so far? Let's start with what Victoria said. What do we know so far?

STUDENT: We know that Jake and Leo arrived, stay together, and the Potato Heads always --

TRACY LEWIS: Okay, so I need someone to be Jake. Okay, DeAngelo --

STUDENT: And Nia.

TRACY LEWIS: And who's going to be -- Nia, would you like to be Mia? Since your name is so close? Okay, so they always -- what?

STUDENTS: Stay together.

TRACY LEWIS: Stay together. Okay, do we know when they came in the door?

STUDENTS: No.

TRACY LEWIS: No. We don't know that yet. What else do we know for sure? Kellan.

STUDENT: That the Potato Heads are -- I forgot.

TRACY LEWIS: You forgot. Ayana.

STUDENT: What we know for sure is that dude was wearing a bathing suit. I mean Ford was wearing a surfer's suit because it says, "The person that arrived first was wearing a bathing suit," and it says, "Ford was a surfer dude."

TRACY LEWIS: Okay, so which one -- what information do we know for sure? Ms. Lewis had something here. I have some labels. Because you told me that good mathematicians use labels and they use words. So, Ms. Lewis has some words. What does -- can you see what this says? What does this say?

STUDENTS: Potato Head.

TRACY LEWIS: That says Potato Head. What does this say?

STUDENTS: Potato Head.

TRACY LEWIS: And what about this one?

STUDENTS: Surfer.

TRACY LEWIS: Surfer dude. So can I give these labels to some of my actors? So we know who they are?

STUDENTS: Yes.

TRACY LEWIS: Okay. So, you're saying, from what we read on this paper, you know that surfer dude is? Or not surfer dude. But Potato Head is?

STUDENTS: Mia and Jake.

TRACY LEWIS: But we don't know what order they came through the door yet. Who is surfer dude? What is surfer dude's name? Do we know what surfer dude's name is?

STUDENTS: Yes.

TRACY LEWIS: Surf--

STUDENTS: Ford.

TRACY LEWIS: Ford. Who would like to play Ford?

STUDENTS: Giovanni. Giovanni. Giovanni.

TRACY LEWIS: Okay, play surfer dude. All right. What else do we know for sure? What else do we know for sure? What else do we know for sure? Erin?

STUDENT: That Barbara was the last to arrive.

TRACY LEWIS: Barbara was the last to arrive. Can I get someone to play Barbara? Thank you, Sarah.

STUDENT: Sarah.

TRACY LEWIS: Sarah. So if Sarah is Barbara, that means what order should she be in? Can we figure it out?

STUDENT: Yes.

TRACY LEWIS: She should be …?

STUDENT: Last.

TRACY LEWIS: Last, so can you place yourself last? What does that look like?

STUDENT: No.

STUDENT: I think I know what order ...

TRACY LEWIS: Well, I think it would depend on where the door is. Where the door is. And she's looking at the door, she's saying the door is over there. So if they were going out to a party, Sarah would be last. Do we know who came in first?

STUDENT: Yes.

TRACY LEWIS: Oh wait, Giovanni, what were you saying?

STUDENT: That she's the vampire, because it says "The vampire arrived after Superman."

TRACY LEWIS: "The vampire arrived after Superman," but why do you know that she's the vampire?

STUDENT: Oh, I know why.

TRACY LEWIS: What are you thinking?

STUDENT: I'm thinking --

TRACY LEWIS: Let him finish his thought.

STUDENT: It said, that Superman arrived right before Barbara.

TRACY LEWIS: Superman arrived right before Barbara. So ...

STUDENT: So Barbara's Superman -- No, Barbara's the vampire, and somebody else is Superman.

TRACY LEWIS: And somebody else is Superman. Okay, so I think they're doing some rearranging and some figuring out. So what Ms. Lewis has for you is I have Superman. I have a title that says Superman.

STUDENT: I'm vampire.

STUDENT: Giovanni is the Superman.

TRACY LEWIS: And right, now Sarah says she thinks she's the vampire.

STUDENT: Yeah because I came after Superman, and it says Barbara came right before Superman, and Superman came after vampire, so I'm vampire, and somebody else has to be Superman.

TRACY LEWIS: Does that make sense to everybody?

STUDENTS: Yes.

TRACY LEWIS: Yes? Or kinda-sorta? Or "I'm not sure"?

STUDENT: It said that I came after.

TRACY LEWIS: "I'm not sure," okay. So this is what Ms. Lewis is going to do. So far, we know we have how many people?

STUDENTS: Six.

TRACY LEWIS: We have six people, and I think you figured out that Jake and Mia are supposed to stay ...

STUDENTS: Together.

TRACY LEWIS: And we figured out that they are probably Mr. and Mrs. ...

STUDENTS: Potato Head.

TRACY LEWIS: Or the Potato Heads. We know we have a vampire, but some people are saying, "Yeah, maybe the vampire's Barbara," or "Ms. Lewis, I'm not sure, I think it might be somebody else."

STUDENT: Do I need to explain it a little better?

TRACY LEWIS: No, we're going to figure it out. We know we have a maid.

STUDENT: I wanna be the maid.

TRACY LEWIS: Okay. And since Sarah thinks that she's the vampire, we're going to let her hold that. So, who's Superman?

STUDENTS: Giovanni.

TRACY LEWIS: Oh, maybe Giovanni's Superman, I'm not sure. Who's wearing the bathing suit?

STUDENT: Oh, I wanna change it.

STUDENT: I'm wearing the bathing suit.

TRACY LEWIS: Ah, so so far, we've figured out that you -- we know what he's wearing because he's surfer dude, he's got on the bathing suit, and we know their names. That's all the information that we could -- we know for sure so far. How many people are going to this party in the costumes?

STUDENTS: Six.

TRACY LEWIS: Okay, so we know that there are six people. So here's what you're going to do -- thank you very much actors, you can have a seat.

STUDENT: But I'm wondering who made the costumes.

TRACY LEWIS: You're wondering who made the costumes?

STUDENT: The tailor.

TRACY LEWIS: Or who decided to have a costume party. Do you think that's important to figure out what order they came in thought?

STUDENT: Yes.

TRACY LEWIS: Do we need to know that information to figure out ...?

STUDENT: Yes.

STUDENTS: No.

TRACY LEWIS: Some friends say no, some friends say yes. Have a seat real quickly because I'm about to put you to work. Are you ready?

STUDENTS: Yes.

TRACY LEWIS: I'm sorry, I'm standing in your spot.

STUDENT: Ms. Lewis, do we keep these?

TRACY LEWIS: I'm going to tell you right now, as soon as I have everybody's attention. Three -- Thank you.

TRACY LEWIS: You have some people. These people are not dressed in their costumes. Okay? So, you can use this if you want to. If you don't want to use it, you don't have to use them. Okay? So, are we going to spend all day trying to cut these people out perfectly?

STUDENTS: Nooo!

TRACY LEWIS: No, you're just going to take a pair of scissors and you're going to kind of cut around. Ms. Lewis was trying to get as many people on the page as I could to save the trees. All right, so you have -- how many of these do you think you'll need?

STUDENTS: Three!

TRACY LEWIS: Think you'll only need three? Only three people are going?

STUDENTS: Six!

TRACY LEWIS: Six. Okay, and so, may I borrow your title? So what you get to do is you get to move these people around and you also get to put a title on them. Use the clues that you have on the paper to move this title. At first you might think this person is wearing a bathing suit and then you might figure out [gasps] wait a minute, I got a little more information and I don't think that anymore. Now I think this is one of the Potato Heads, Okay? So, depending on what you're thinking and the clues that are on the paper, you may use these people and these titles or you may write on them. Please do not try to color them in. That's not what we're doing right now.

STUDENT: Can we make eyes? Can we put their name on the bottom?

TRACY LEWIS: If you would like to write a name, you can write the name on the bottom and say this person is always going to be Jake or this person is always going to be Mia. Yes, you may do that ... names, but no decorations. You may write what?

STUDENTS: Names.

TRACY LEWIS: Names.

STUDENT: But no decorations.

TRACY LEWIS: No decorations, okay. And then you get to move these around and see if you can figure out who came first, second, third, fourth, fifth, and …?

STUDENTS: Sixth!

TRACY LEWIS: And sixth, okay?

STUDENT: And that's an even number.

TRACY LEWIS: Shh. And sixth is an even number. You are correct. So that's what we're going to do for the next, oh ... fifteen, twenty minutes. Let's see how far you can get with this activity, okay? And then you can record how far you get and then we'll come back to it later on today

and you'll also get an opportunity to work on sending. I see one, two, three hands. Are these questions?

STUDENTS: Yes.

TRACY LEWIS: Yes question, Ayana first.

STUDENT: It's a comment.

TRACY LEWIS: Hold your comment, questions first. Victoria?

STUDENT: I had a question. I have to tell you something ... that I don't think, I don't think Barbara, I don't think that Carol, I think Barbara, I think Barbara is the maid and Carol is the vampire because it says on line ... the line, it says the French maid --

TRACY LEWIS: The French maid was not Carol.

STUDENT: So I think it's Barbara. I think it's Barbara. So it says the French maid was Barbara and the vampire was Carol.

TRACY LEWIS: Okay, so you're already thinking ahead about some of these clues. So at first, we were thinking maybe the vampire is Barbara. Victoria is saying “Ms. Lewis, I don't think that anymore.” So the reason I don't want you to write their titles down is because you might change your mind. Another question. Isaiah.

STUDENT: How are we gonna record the little thing?

TRACY LEWIS: Where can you record it? On here. And you also get these so you can record your information on here. Some friends may not want to use these. They might just want to use a pencil and a piece of paper, or you might want to use something different, okay? So I'm leaving that option open for you. You don't have to use these because some people are like, "Ms. Lewis, I don't want have to cut these out, okay?" Are these questions or comments?

STUDENTS: Questions. Comments.

TRACY LEWIS: Questions first. Yes?

STUDENT: If we wanna stick them to our paper and then staple them together?

TRACY LEWIS: Yes, you can staple them together when we're done. I see you all have a lot of comments and there are some things you want to share, so, here's what I'm going to tell you you can do. You can partner up, okay? You may choose a partner or you may decide that you want to work on it alone. I will leave that option to you. Where can you work in the room? Let me answer that now. So glad you asked. You may work at your team table, you may work on the carpet by your team table, two groups can work in the library, no more. So either work at a team table, if you want to be on the floor on the carpet to move things around, you can do that at the desk where you are, or two teams may work in the library. No more questions. Let's get started.

STUDENT: Now Barbara, and she arrived after Superman, I think Superman was Carol. So he's near the end now. Ford.

STUDENT: -- would be the French maid, because Jeff is a ma -- a boy, and Carol is a girl, so I think she's the maid.

STUDENT: So, I think that Jake is the surfer dude. That's what I think he is.

STUDENT: Why do you think he's the surfer dude?

STUDENT: Probably because he likes to surf, probably that's why.

STUDENT: Well I think, I think ...

STUDENT: Or, Mia and Jake could be the Potato Heads.

STUDENT: I think Ford, he's the surfer dude, because it says, "The person that arrived fourth was wearing a bathing suit," and it says that "Ford was a surfer dude," so I think those two sentences go together. So, what do you think about Jeff? What do you think he -- I think he's Superman.

STUDENT: I think Jeff is the -- is Superman.

STUDENT: I do too. But we'll have to see. It depends if we finish the problem and it depends if we figure it out.

STUDENT: We're drawing a -- the people who came to the party, and we're writing their names on the top.

SPEAKER: How does drawing a picture help you?

STUDENT: Well, because, umm, we can figure out their names -- I mean, their names and we can write any name that we want to write on their -- on those people. Like, I names her -- him Jeff, like, and I named her Mia. Like that.

STUDENT: We were writing pictures because that helps us figure out who is who.

STUDENT: Well, I'm just putting the names on them right now, but the hard thing is I lost my maid thing. So I'm probably just gonna use my scraps to make a maid. And, I figured out the Potato Heads were Jake and Mia, and that the surfer dude was Ford. I'm pretty sure Barbara was the vampire.

STUDENT: There's a maid right here.

STUDENT: Oh, thanks. That's where my maid was. And, I'm pretty sure since the vampire arrived after Superman, and Superman arrived right before Barbara, so I'm pretty sure the vampire was Barbara. Superman I think was Carol, and -- so I'm not sure about these two, but I'm gonna keep on working to find out. That's pretty much --

SPEAKER: Is this the order that they came to the party?

STUDENT: No, I haven't -- I'm gonna figure out what the costumes were before I figure out the order. But that's pretty much what's happening with mine right now.

STUDENT: So, I am cutting up my pieces but I'm not sure because I'm still cutting up my pieces though. But I -- because I just got finished cutting those out, but I'm not sure. So, I just gotta, you know, cut out my pieces, and then I think I'll be sure. But I agree with her, but yeah.

STUDENT: What I'm doing is I'm sorting out the words and -- and I'm putting names on. So I think Jake and Emmy is Potato Heads. And Barbara is the vampire. And Carol is a maid and that's it.

STUDENT: What I'm doing is having -- I was cutting out the people. I was sorting out the people and then I started to cut out the names and I think Barbara is the maid because it says on my paper, it says "the French maid was not Carol" so now I think it's Barbara. And I think, and I think Jeff is Superman because it doesn't say anything about Jeff and everybody else has their own costume because we already figured out all their costumes, and Jeff is the only name left, so I think he's Superman.

TRACY LEWIS: What are you thinking?

STUDENT: I think I figured it out.

TRACY LEWIS: Can you tell me?

STUDENT: Because they didn't say where the Potato Heads were but they said that these two -- I know these two were second to last and I know he was fourth and the maid was first so I'm pretty sure they go right here.

TRACY LEWIS: Okay, how do you know the maid was first?

STUDENT: I'm pretty sure the maid was first because, well I know the maid was first because they said, said, let me just find it.

TRACY LEWIS: Is this it right here?

STUDENT: Superman arrived right before Barbara, told to that piece too. Oh, here. The first person was dressed as a French maid, that's how I know -- well I'm not sure that Jeff was the maid but I'm pretty sure because Carl was not the French maid and these two were the last ones I had so I know that, so I know that Carl was Superman and Jeff was the French maid. And I know these two -- oh yeah, I already told you that. Okay, Ford, I know he was fourth because it says that for fourth the person that arrived fourth was wearing a bathing suit so, four --

TRACY LEWIS: So you established that because we talked about that with Ms. Lillis.

STUDENT: Yeah.

TRACY LEWIS: I'm really curious that you have Jeff as the French maid. Can you tell me more about your thinking about how you decided Jeff was the French maid? I heard you go through it pretty quickly and you went through it so fast I'm not sure I followed your reasoning.

STUDENT: Well because the Superman and the French maid were the last ones I had.

TRACY LEWIS: What do you mean by the last ones they had?

STUDENT: Because I figured that these two, this one and this one, so they were the last two costumes I had.

TRACY LEWIS: Okay, I see. Okay.

STUDENT: So I just -- but since it says Carl was not the French maid, so then I knew that Carl was Superman. So then that left me with Jeff as the French maid.

TRACY LEWIS: And you were okay with that?

STUDENT: Mm-hmm. [nods head]

TRACY LEWIS: And you're feeling really confident about that decision?

STUDENT: [nods head] But from the, from Superman arrived right before Barbara and the vampire arrived after Superman, that told me that Barbara was vampire. Because if the vampire arrived after Superman, and Superman arrived right before Barbara, Superman must have been Carl and Barbara was the vampire.

TRACY LEWIS: So you've established who's whom, and you've reasoned that out, and you're feeling that this order that they have to be in.

STUDENT: Yeah.

TRACY LEWIS: So you feel like you have the solution?

STUDENT: Yeah.

TRACY LEWIS: Okay. Thank you.

STUDENT: You're welcome.

STUDENT: I figured it out because I was looking at the clues on the paper --

TRACY LEWIS: Uh-huh.

STUDENT: And this said -- I looked at the clues, and the French maid was not Carol so it couldn't -- the French maid was not Carol so um Carol, they got mixed up, like -- oh wait.

TRACY LEWIS: Are you -- ?

STUDENT: And this said Barbara was the last to arrive so [crosstalk] study the vampire and it's still be Carol. But maybe they're trying to trick us, and say that it was not Carol but it really was Carol.

TRACY LEWIS: Okay, so you're telling me that this is Carol?

STUDENT: Yes.

TRACY LEWIS: Okay.

STUDENT: And I'm saying in the last two persons that I saw, was this person, this person, and I know these are Potato Heads.

TRACY LEWIS: Okay. The only thing is, I don't know who this is? I know that you're telling me that this is Ford, and I know you're telling me that this is Barbara, but I'm looking for more evidence.

STUDENT: Okay, this is Jeff.

TRACY LEWIS: That's Jeff? Okay.

STUDENT: And the maid ... I think the maid is Carol. And this is going to be Mia.

TRACY LEWIS: That's correct, M-I-A.

STUDENT: And Mia is Jake. Jake.

TRACY LEWIS: So when I look at this, I'm still trying to figure out the order. I'm looking for more evidence. I see words, I see a picture --

STUDENT: Yeah, um, and --

TRACY LEWIS: Figure out which person is wearing what, we did that.

STUDENT: Yeah.

TRACY LEWIS: What costume. And when they arrived at the party.

STUDENT: Okay. I put them in order from first to last.

TRACY LEWIS: Mm-hmm.

STUDENT: And I just looked [inaudible], and they said Barbara was the last to arrive so I know she's the vampire.

TRACY LEWIS: Okay.

STUDENT: Because she was the last one to arrive. And Carol was the first one to arrive, so if she was the first one to arrive then she's the maid.

TRACY LEWIS: So she has to be the maid.

STUDENT: Yeah, she has to be the maid.

TRACY LEWIS: Do you think that if someone else came over here and looked at this that they would know that this is the last person and that this is the first person, or is there something else that you could add to this to help people if they just walk right by and go, "Wow, she figured it out!" How would they know who came first, second, third, fourth, or fifth?

STUDENT: A label?

TRACY LEWIS: Show me what label you would put on there.

STUDENT: I would put, I would put --

TRACY LEWIS: Hold on one second, sweetie.

STUDENT: First here, and then put last here so they would know.

TRACY LEWIS: But what would we call these people in here?

STUDENT: It would be first, second, third, fourth, fifth, and sixth.

TRACY LEWIS: Ah, can you put it on there so we can see it? I like how you're thinking.

STACI CARIGNAN: Gabby, what did you get? Four -- four girls had short blond hair?

STUDENT: Yeah, because, well, I put down four people because eight had long hair and four had short hair, and they said that, "How many people will have short, red hair?" So, the short blond hair girls are the ones -- all they have to do is dye their hair red ...

STACI CARIGNAN: [laughs] Do you think anyone's gonna dye their hair red?

STUDENT: ... so it would be short.

STACI CARIGNAN: Is that what the problem's asking us, Gabby? Are they gonna be dyeing their hair? No. I want you guys to keep talking as I walk away. And as I walk away, I want you to think about -- how did you get that four girls? Because you guys all agreed that four girls had short, or had red hair, right? Is there some kind of diagram you can draw to show that? Or is there some kind of visual representation you can use to show that? Is there?

STUDENT: I guess.

STACI CARIGNAN: You guess? You want to try it out? That's the spirit. All right, keep going. I'll be back.

So, what is, what is the problem asking us? What does it want us to find out?

STUDENTS: How many people have red hair.

STACI CARIGNAN: How many people have red hair. Okay, so boys or girls have red hair. Do any of the boys have red hair?

STUDENT: No.

STACI CARIGNAN: No, so we know that ...

STUDENT: [inaudible] girls.

STACI CARIGNAN: ... we're looking for girls here. Okay. So, how many boys and girls are at the party?

STUDENT: 16. 16 boys and girls.

STACI CARIGNAN: How do you know that 16 boys and girls are at the party?

STUDENT: There's 2 divided by 30 -- 2 divided by 32 is 16.

STACI CARIGNAN: 2 divided by 32, or 32 divided by 2?

STUDENT: 32 divided by 2.

STACI CARIGNAN: So there's 16 boys and there's 16 girls. Okay. So, let's go to the next part of the problem. Let's go back to the first part. "At Leslie's party, one-fourth of the people had long hair." So, what's -- how many people are at the party?

STUDENTS: 32.

STACI CARIGNAN: 32. So what would be a fourth of 32?

STUDENT: Eight.

STUDENT: Eight.

STUDENT: No, four. Eight, yeah.

STACI CARIGNAN: Eight. Agree? So, then how many people had long hair?

STUDENT: Eight.

STUDENT: Eight.

STACI CARIGNAN: Eight. Do any of the boys have long hair?

STUDENT: No.

STACI CARIGNAN: So, it's only the girls who have long hair. Did you somehow note that on your paper somewhere, that if you have 16 girls, we know that eight of them have long hair?

STUDENT: I put eight short hair, eight long hair.

STACI CARIGNAN: Okay. So if eight of them have long hair, how many girls does that leave?

STUDENT: It leaves [inaudible] eight more girls.

STACI CARIGNAN: We still have eight more girls, okay? Let's go to the next part of the problem. One-half of the people at the party were boys, and one-fourth of the girls had short, blond hair. One-fourth of the girls ... Well, how many girls are at the party?

STUDENT: 16.

STACI CARIGNAN: So if one-fourth of the girls had short, blond hair, how many girls actually had short, blond hair? So what --

STUDENT: Eight.

STUDENT: Four.

STUDENT: Four.

STACI CARIGNAN: So one-fourth -- you're saying one-fourth of 16 is four, Nyema?

STUDENT: Hmm?

STACI CARIGNAN: You're saying one-fourth of 16 is four? So how many people had short, blond hair, then?

STUDENT: Four.

STACI CARIGNAN: Okay, so if we had four people with short, blond hair, and we had eight girls with long hair, how many girls is that so far? What's the four girls with the short hair, and the eight girls with the long hair? How many do we have?

STUDENT: 12.

STACI CARIGNAN: We have 12. But how many girls came to the party?

STUDENT: 16.

STUDENT: 16.

STUDENT: 16.

STACI CARIGNAN: So, how may girls do we have unaccounted for right now? How many girls we don't know about their hair?

STUDENT: Three.

STACI CARIGNAN: Three?

STUDENT: Three.

STUDENT: Four.

STACI CARIGNAN: Why don't you guys talk about that? And really take a look at the girls, and -- because we know there's 16 girls, and we've split them up a couple different ways, so you may want to go back and talk about, right now, how many girls have what kind of hair. Okay? I'm going to put a clue up on the board in about two minutes, so be checking for that, okay? Nice job. Keep going. I like the way you guys are proving to one another. I like that everyone's voice is being heard now. Thank you all.

Whew!

STUDENT: ... people that have long hair. And we have one-fourth of boys, so that's eight. Then we still have this four, and those four are the ones with red hair. So all together we have four groups, so that's how I got my answer before. Because we have red-haired group, boys, girls, and long hair, so ...

STUDENT: But blond hair.

STUDENT: Yeah, blond hair. Oh, so the girls have blond hair.

STUDENT: You need blond hair, girls, and boys, and red hair.

STUDENT: Yeah. So ... Um, well ... Nyema, do you get it now?

STUDENT: Yeah.

STUDENT: How -- we got our answers? Do you change your mind?

STUDENT: [inaudible] understand?

STUDENT: I could [inaudible].

STUDENT: So we should write down how we got our answer, so we can remember when we come back.

STUDENT: 16.

STACI CARIGNAN: So -- quick question -- how did you know that there were 16 boys and 16 girls at the party. Juan?

STUDENT: Um, because it -- 16 plus 16 is 32.

STACI CARIGNAN: Okay.

STUDENT: And, um, I put 16 girls and 16 boys.

STACI CARIGNAN: 16 girls and 16 boys, okay. Agree? Okay. So let's -- getting back to our problem. "One-fourth of the people at the party had long hair."

STUDENT: One-fourth of, um ...

STACI CARIGNAN: So how many people had long hair?

STUDENT: One-fourth of ei -- of 32 is eight.

STUDENT: Eight.

STUDENT: So ...

STACI CARIGNAN: Why did you decide one-fourth of 32, rather than one-fourth of 16?

STUDENT: Because, um ... eight girls had long hair?

STACI CARIGNAN: Say that again?

STUDENT: Because four -- eight girls had long hair?

STACI CARIGNAN: So -- and how do we know that eight girls had long hair? Salia?

STUDENT: Because one-fourth of ...

STACI CARIGNAN: Because one-fourth of what?

STUDENT: Uh ... 32?

STACI CARIGNAN: Of 32. Okay. So, if I have 16 boys and 16 girls, you're saying that if these are my ladies right here, you're saying that this would be the amount that represents what?

STUDENT: Girl [inaudible].

STACI CARIGNAN: Girls with long hair, because this is one-fourth of 32, right?

STUDENT: Mm-hmm.

STACI CARIGNAN: Okay. So then, how did you get these two?

STUDENT: Because -- because, um, it's a, um, because it says, "What's" -- because to get -- because half of -- it said half of the kids at the party were boys.

STACI CARIGNAN: Mm-hmm.

STUDENT: So that makes this 16. But how would you split these to make 16, to add them -- to add 16 plus 16 equals 32?

STACI CARIGNAN: Okay. So, if these are my girls with long hair, then that means we've got eight with long hair, eight with some other kind of hair, right?

STUDENT: Short.

STUDENT: Short, red, and blond.

STACI CARIGNAN: Short, red, or blond hair. So, what my real question is, is how did you know that four girls had blond hair, leaving only four girls with red hair?

STUDENT: Because the last ...

STACI CARIGNAN: Hold a second, I'm gonna let -- he's really excited to talk. Go ahead.

STUDENT: Because one-fourth -- one-fourth's supposed to be blond and one-fourth's supposed to be red.

STACI CARIGNAN: One-fourth of what? 16 or 32?

STUDENT: 16.

STUDENT: 16.

STACI CARIGNAN: Why 16, Salia?

STUDENT: Because you already have 16 [inaudible].

STACI CARIGNAN: So that means that 16 -- we have 16 girls. Half of them have this, and the other fourth have this. Is there -- it looks like you've already drawn pictures of that. So, what I want you to think about as I walk away is -- how do you know you're correct? How could you prove it?

STUDENT: You could --

STACI CARIGNAN: Talk -- talk about it [inaudible].

16 boys, 16 girls. Agree, Carolina? How do you know that?

STUDENT: Because there's 16 [inaudible].

STACI CARIGNAN: Okay, so then since it said that one half are boys, one half are girls, we have 16 boys, 16 girls. Jayden, agree? Agree, okay. Now what?

STUDENT: So one-fourth of the girls had blonde, short blonde hair. That's one-fourth of the girls.

STACI CARIGNAN: One-fourth of the girls. So how many girls were there?

STUDENT: 16.

STACI CARIGNAN: 16 girls?

STUDENT: That should have 8, that's 4, 5, 6, 7, 8.

STACI CARIGNAN: Okay.

STUDENT: Eight. And then the other 16 boys. And these are the four girls that are left.

STACI CARIGNAN: Okay. So then what does that represent?

STUDENT: The girls with short red hair.

STACI CARIGNAN: So how do we know, Shamari, how do we know that four of them could possibly have short red hair? How do we know that?

STUDENT: Because 4 times 9 equals 32?

STACI CARIGNAN: So here's what I want you to do. I'm going to walk away and I want you guys to agree, talk with each other, about that. So you guys have some really interesting ideas here.

Really good thinking going on. So write two-fourths, what you told me.

STUDENT: [inaudible]

STACI CARIGNAN: Sure, yes. Maybe we can help her keep track of her thinking.

STUDENT: 16 people.

STACI CARIGNAN: Now ...

STUDENT: That's half, that's half, um, of 32 and half of them [crosstalk].

STACI CARIGNAN: Right. So now what we have to do is figure out what fourth of the people had long hair. Did any of the boys have long hair?

STUDENTS: No.

STUDENT: None of the boys had long hair.

STACI CARIGNAN: So what does that tell us? All of the girls had to have ...?

STUDENT: Long hair.

STUDENT: Two-fourths, would be ...

STACI CARIGNAN: Do what you're thinking, play with the math.

STUDENT: [inaudible]

STACI CARIGNAN: So how are we going to figure that out?

STUDENT: [inaudible]

STACI CARIGNAN: Okay, what are you going to divide?

STUDENT: Um, 16 divided by 2.

STUDENT: How'd you get 16 divided by 2?

STACI CARIGNAN: No, your thinking is good. What's the sixteenths stand for?

STUDENT: Stands for how many people I divided from two-fourths divided by 3.

STACI CARIGNAN: So there's 16 girls. So why don't you label that? Put 16 girls.

STUDENT: 16 girls had short blond hair.

STACI CARIGNAN: Put a G for girls right here -- can you sit down? So this is going to help you keep track of your thinking. So you know where we got the 16 girls?

STUDENT: 16 boys and 16 girls.

STACI CARIGNAN: Now you divided by 2, and why did you divide by 2? You were thinking of the two-fourths. Because first we were looking at two-fourths of 32, and now we're looking at two-fourths of --

STUDENT: Yeah, before what I thought was --

STACI CARIGNAN: 16, right?

STUDENT: What I had is maybe I could divide it by 2 until I can't divide it by 2 anymore. And then I can multiply it by 2 to get [inaudible].

STACI CARIGNAN: Okay.

STUDENT: So maybe --

STACI CARIGNAN: So what does this 8 stand for?

STUDENT: But I thought --

STACI CARIGNAN: You took the two-fourths of 16 --

STUDENT: How many girls.

STACI CARIGNAN: How many girls what?

STUDENT: How many girls have short blond hair.

STACI CARIGNAN: Write it down. Or wait, how many girls had long hair.

STUDENT: Okay.

STACI CARIGNAN: Because none of the boys had ...

STUDENTS: Long hair.

STACI CARIGNAN: Long hair. So write down your thinking, okay. So what do we know for sure based on your math? How many had long hair?

STUDENT: Eight people -- eight girls.

STACI CARIGNAN: Eight girls had long hair. Out of how many?

STUDENT: Out of 32.

STACI CARIGNAN: Out of how many girls?

STUDENT: Oh, 16.

STACI CARIGNAN: Okay, so we know that two-fourths, or half of them, half of the girls had long hair.

STUDENT: So maybe eight of the other girls had short red hair?

STACI CARIGNAN: So how many are left, how many girls are left? If eight of them have long hair, how many girls do we have left?

STUDENT: Eight.

STACI CARIGNAN: Eight. So we have eight left. We know for sure that eight had long hair. Now how can we figure out how many had blonde hair, short blonde hair?

STUDENT: So we have to divide 8 with one-fourth. Because it says one-fourth of the girls had short blonde hair.

STACI CARIGNAN: Can you put another 8 down here for me? I'm sorry, 8 circles.

STUDENT: Oh, okay. 1, 2, 3, 4, 5, 6, 7, 8.

STACI CARIGNAN: Okay, so which one of these -- so half of them had, 16 of them had the long hair, so can you mark off which ones had the long hair? Your brain's on fire and you've got good mathematical thinking. One of the things that mathematicians have to do is we have to keep track of our thinking so we don't get lost. So writing it down what we're thinking, like you've got your drawings here, is really helpful. Okay.

STUDENT: There's too much outlook.

STACI CARIGNAN: Okay, how many have white, blonde, I mean how many have --

STUDENT: Short blonde hair.

STACI CARIGNAN: Short blonde hair?

STUDENT: 1, 2, 3, 4, 5, 6, 7, 8.

STACI CARIGNAN: And how many have -- well, we have blonde hair and red hair.

STUDENT: No, short blonde -- red hair. Eight of them have short red hair.

STACI CARIGNAN: Well if eight of them have short red hair, how many are going to have long blonde hair?

STUDENT: Eight.

STACI CARIGNAN: So you have to figure out how many of the girls that are left have the blonde hair and how many of the girls that are left have red hair.

STUDENT: No, when it says blonde, it means red-blonde hair.

STACI CARIGNAN: So how many of the girls left have red hair, short blonde hair --

STUDENT: Short blond hair.

STACI CARIGNAN: Why don't you underline short blonde hair and how many have red hair.

I'm seeing people snap as they're looking at this, and I've seen quite a few people looking at this. When you see this, what are you thinking about when you see this? What are you thinking about? Bemnet, what do you think about when you see this?

STUDENT: Division?

STACI CARIGNAN: You're thinking division? In what kind of way?

STUDENT: Um, if you have 16 boys that don't have any short hair and you have 8 girls that has long hair, then if you do 16 plus 8, 24, then 32 subtracted by 24 is, yeah, 32 subtracted by 24, then you know how much are left over and you might get how many have short blond hair.

STACI CARIGNAN: What are you thinking about when you see the chart?

STUDENT: A big one, like a big rectangle that's a 16 and then there's two small squares. One says 8, and those two small squares are like 16, divided by 2 equals 8.

STACI CARIGNAN: So you're saying that this square plus this square would be equal to 16?

STUDENT: No, like, I mean those two squares they like represent like the division and like if you do 16 divided by those two squares, it will equal to 8.

STACI CARIGNAN: Okay. Thank you very much. Ladies and gentlemen, I'm going to give you a couple more minutes to continue to work with your partners. By the time we get to 11:15 we're going to stop and we're going to do a little bit of writing about this, and whether you're done or not -- and that's completely okay if you're still thinking about the problem. But I want you to spend the next couple minutes thinking about where you are in the problem, and what this diagram might have to do with the problem. Okay? You guys have a couple more minutes. Continue please, thank you.

TAHEEDAH WREN: All right, so let's review our group goals today. And then we're going to get started quickly. Class?

STUDENTS: Show your work. Explain your thinking. Work as a team. Cooperate. Everyone participates. Voice level -- six inches. Voice level -- six inches. Six inches voice level!

TAHEEDAH WREN: Okay, so let's remember to keep our voices down but we want you to be conscious of speaking clearly and explain your thinking in a way that we can hear you but not too loud that we're disturbing our neighbors, okay? So we're going to start with the problem of the month called "Party Time." And you have the paper in front of you, so we're going to read together the instructions. You should have a set of counters that are coming around for everyone to use. So, we're going to start with -- who likes to have parties in our class? Oh, gee. All right, so that's the majority. So, we're going to solve a problem that is about having a party. Inviting people to a party.

So we're going to solve this problem today. Who would like to be our party host?

STUDENT: Ohh!

TAHEEDAH WREN: No "ohh's," just a quiet hand, thank you. Let's see, party host. Where's our equity sticks? Because I'm going to get in trouble. Okay, pull one. Quickly.

STUDENT: Number six.

TAHEEDAH WREN: All right, who's number six, come forward. Come on. And I need one more -- two more.

STUDENT: 28.

TAHEEDAH WREN: 28 is not here, so Leah. You've got everything?

So we're going to invite a few people, this is our first -- come up front.

STUDENT: 13.

TAHEEDAH WREN: Is 13 here? All right, good. You may not need your paper. So, we have three guests at our party. Did you say your names?

STUDENT: My name's Amy.

STUDENT: My name's Eric.

STUDENT: My name's Deana.

TAHEEDAH WREN: So, how many people are in our party?

STUDENTS: Three!

TAHEEDAH WREN: Wow. Wow, I was right. Suppose each of our friends phone two people to come to the party. They're gonna call two people to come to the party. How many will there be at the party? Quiet hands. Max.

STUDENT: Six people.

TAHEEDAH WREN: Six people all together?

STUDENT: No -- wait no -- because if they invited two friends -- wait -- that's nine.

TAHEEDAH WREN: Suppose each friend, each of our friends up here, invited two people to come to the party? How many people would be at the party all together, Max? Let him think, give him a minute. Do you want to use your counters to help you figure it out? Your counters in front of you. You want to help -- use that to help you in any way?

STUDENT: No.

TAHEEDAH WREN: What did you say? Did you understand the question? Want me to repeat it?

STUDENT: Yes, please.

TAHEEDAH WREN: Okay, anyone else? So Max, do you want to try it, or what? Okay, want to call on someone to support you?

STUDENT: [inaudible]

TAHEEDAH WREN: You can call somebody, you can just -- all right.

STUDENT: I'll say -- can you repeat the question?

STUDENT: Oh!

TAHEEDAH WREN: Shhhhhh. Yes. So -- Okay. Each of your friends, they phone two more people. How many people are at the party all together now?

STUDENT: There -- there -- there would be --

TAHEEDAH WREN: You can show your work with your markers, with your counters --

STUDENT: 12 people.

TAHEEDAH WREN: 12 people -- people. Look around, I see some disagreements. I see -- shh -- how -- how many did I say, class?

STUDENTS: Two.

TAHEEDAH WREN: So if each invited three people, it would be different. But the questions is, each one of those -- of our guests in front of the class invited two people. How many are at the party all together?

STUDENT: No.

TAHEEDAH WREN: Are you showing your work? You guys agree?

STUDENT: Didn't I just say nine?

TAHEEDAH WREN: Did he say nine?

STUDENTS: Yes.

TAHEEDAH WREN: I didn't hear him say nine. Is that correct?

STUDENTS: Yes. No.

TAHEEDAH WREN: All right, so why don't you invite two people, have them come over. Each one of you, let's act it out. So each one of you will invite -- call two people. Shhh, okay.

STUDENT: Michelle. And Symphony.

STUDENT: Lebron and Marquis.

STUDENT: Cindy and Jerome.

TAHEEDAH WREN: So, how many people do we have all together?

STUDENTS: Nine.

TAHEEDAH WREN: Let's count them again. Count your people up there.

STUDENTS: One, two, nine, nine, nine.

TAHEEDAH WREN: So, Max. What do you think? What are you thinking, Max?

STUDENT: I said nine.

TAHEEDAH WREN: Yes. How many were not sure about nine? And what helped you to be more sure about the number of people there at the party? Can you explain your thinking?

STUDENT: I don't see why they're disagreeing with me!

TAHEEDAH WREN: Perhaps they needed to see it in front of them.

STUDENT: They did it twice.

TAHEEDAH WREN: Okay. Yes, Cynthia.

STUDENT: Okay, what I didn't get was like, if it was including -- N or whatever your name is -- Cindy. Yeah. I didn't know if it was including Cindy, so then I disagreed with Max, because of that.

TAHEEDAH WREN: All right, and what else? Good thinking. Yes?

STUDENT: First I thought it was five.

STUDENTS: [snapping]

TAHEEDAH WREN: That means yes, they agree.

STUDENT: They -- it was like -- and then when you was asking Max, you said “each,” so then I thought it would be -- then I gave each.

STUDENTS: [snapping]

TAHEEDAH WREN: And what did you total all together?

STUDENT: What?

TAHEEDAH WREN: How many did you have altogether?

STUDENT: Nine.

TAHEEDAH WREN: Okay, anyone else have any -- another way of arriving at this answer, nine, or that have come up with a different answer? Yes? Francisco?

STUDENT: I used my slate and I drew three circles because um -- three circles is -- has -- well, there's one person in each circle first, because -- there would be one person in each circle first that would be the host. And then after the host all invite two people, so then you add six more here and that would equal nine.

TAHEEDAH WREN: So -- so he used his slate to visualize -- to make a model -- to visualize the people represented in the party. And sometimes we need more than one way of seeing it. Like Max, I think, figured it out in your head. How did you figure it out, Max? I won't speak for you, I'll let you speak. Speak.

STUDENT: Because I did -- because there’s three people up there and each of them is gonna bring two people that would make [inaudible] six --

TAHEEDAH WREN: Can you hear? A little louder?

SPEAKER: Max, can you sit up for a split -- what you have to say matters, is important, and we want to hear it.

TAHEEDAH WREN: Yes.

STUDENT: What I did is because there's three people up there, was three people up there, and then you said that each people -- each person -- invites two people to come. And then, um, so I just -- I knew that six plus three equals nine, so I just counted them in my head.

TAHEEDAH WREN: Okay. Anyone? Any more comments?

SPEAKER: How many of you snuck ahead and looked at the other level A? Because I heard you talking about Cindy. There we go. So she appears -- she appears on the next tape. So it's a little bit different question than the first prompt that [inaudible].

TAHEEDAH WREN: So, one, two more comments to Merrick, and then to Lebron.

STUDENT: Um, didn't it say -- doesn't like -- when the party host invites three friends, doesn't it mean them included?

TAHEEDAH WREN: What --

STUDENT: Because there's only three people but there's supposed to be four, but the party owner.

TAHEEDAH WREN: So, we just -- are you thinking -- thinking the same thing? Let's read over and make sure we understand the question.

All right, let's read over. Who would like to read the question again? Who would like to read the question? All right, Temarya.

STUDENT: Who -- who -- who likes to have parties in our class? We are going to solve a problem about inviting friends to a party. Who would like to be our party host? Please invite --

TAHEEDAH WREN: Okay, we don't have to do the whole thing, just read.

STUDENT: The teacher says to the host, "Let's start by inviting three -- let's start by inviting three friends to the party." How many people are there at the party?

TAHEEDAH WREN: Okay, so if you're inviting three people at the party, how many are there?

STUDENTS: Four.

TAHEEDAH WREN: Ah, four people? Four people? Amy, did you say something? Anything else? Keep going. Yes, no, I'm sorry, who's next after him? Lebron? Go ahead, Lebron. Any questions? Or any additional information I can add? After him.

STUDENT: How I got my answer, I already know that two plus one is three, so I just added three, plus three, plus three, which is nine. If everybody invites two people.

TAHEEDAH WREN: Yes, Symphony?

STUDENT: So, also, the reason I thought it was ten was because it said, "Suppose each of the friends phone two people to come to the party. How many will be at the party altogether." So, then I had -- so, since there was three up here and then each invited two and then that would make nine plus the -- Cindy, or the host --

TAHEEDAH WREN: The host.

STUDENT: So then I got ten.

TAHEEDAH WREN: So, does anyone agree with Symphony and change your mind or you still hold on to what you're thinking of? Max, did you understand what she's saying? Someone is the host of the party that invited other people right? So are they -- is that host included when we say how many are at the party altogether?

STUDENT: Yes.

TAHEEDAH WREN: Talk to you neighbor. Yes, take a seat, thank you. Talk to your neighbor about that question.

STUDENT: This page says Cindy had invited two guests, so she has two guests. She has two guests. And then she, her guest each invited four guests --

TAHEEDAH WREN: Okay, this question, did anyone change their understanding or idea about what's -- before you -- have you changed since you've had this discussion, or since we've talked about it in class? Anyone change their position? Yes.

STUDENT: [inaudible]

TAHEEDAH WREN: So, you had the same from the beginning and then it didn't change?

STUDENT: Well, yeah, I did.

TAHEEDAH WREN: You had nine at first?

STUDENT: Mm-hmm.

TAHEEDAH WREN: Okay.

TAHEEDAH WREN: Okay, good. So now we going to let you guys go to the next page where it says "party time level A." And we've done the Problem of the Month many times, so I'm going to let you guys get in your groups and -- first, let's -- let's read over it first. First let's read level A. Everyone take two minutes to read over level A.

STUDENTS: [All reading aloud]

TAHEEDAH WREN: No, quietly. Quietly. Okay, so you guys know your groups. Quietly get into your groups. Group one. [inaudible] I need you to go over there now. Because the camera's here. Group one, go over there. And everybody else get into your groups. First go to your groups. And work in the group. Make sure that everybody's on the same page.

STUDENT: They say each person invites a guest so it's just multiplying by each guest that they invite.

STUDENT: It's multiplying by two and four.

STUDENT: Yeah.

STUDENT: Yeah.

STUDENT: Let's just go back over there.

STUDENT: It's a disaster over there.

STUDENT: I know, but those two people invite four people and four people invite -- three people.

STUDENT: No. It says Cindy had a party and she invited two guests her guests each invite four guests and then those guests each invite three. So that's more than 34. Because it's including Cindy and she invited two.

STUDENT: I know, I did. I know, look, watch. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34.

STUDENT: But then that's more than 34 because she invited two guests including herself.

STUDENT: I know that's including herself. Look. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 ...

STUDENT: ... invites four people. And then those two people she invited, they each invited four people. And then those each invite three people each. That's like 15 or 16 people at a party.

STUDENT: That's like 20-something. That's just like a lot. Because she invited two people and they each invite four guests and then those guests each invite ... So eight guests have to invite three people. Each one of the [inaudible].

STUDENT: No, but it's six because then it says, "and those each invite three guests."

STUDENT: So each one of those eight. Because four plus four is eight, so eight.

STUDENT: Invited three people. And that's what I said.

STUDENT: That's like six -- like 30 or something. That's like beyond [inaudible]. I can only invite 16 to my party. That's way beyond, I'm only inviting 16. That is, woo! And then they ...

STUDENT: She invited -- her guests each invited four guests and then those guests invited three guests. So you have to double it.

STUDENT: So she's -- Cindy invited them. They invited them. Everybody --

STUDENT: Somebody's gonna get shot at this party. Seriously. That's a lot of people. That's not a joke. Of course, someone always gets shot.

STUDENT: She invited three guests. Two plus three …

STUDENT: 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35. 35 people in the house.

STUDENT: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 ...

STUDENT: Uh, you need to write one more of -- person here. I'm just saying like right here there's supposed to be one more person I know.

TAHEEDAH WREN: Okay, talk to Max about it then. You did what?

STUDENT: I keep getting lost.

TAHEEDAH WREN: So -- what do you think about drawing it? You think that might help?

STUDENT: Yeah, I can.

TAHEEDAH WREN: Okay, so draw it on here so we can see your thinking.

STUDENT: Draw Cindy first.

TAHEEDAH WREN: Good. Good thinking.

STUDENT: That's a lot of people at a party. Y'all figure out the answer.

STUDENT: That's 35.

TAHEEDAH WREN: You think? All right, let's see what Max comes up with.

STUDENT: Max said somebody's gonna get shot if you -- if you, uh -- if you invited 100 people off of Myspace and you didn't even know them.

TAHEEDAH WREN: All right. So how is that connected to this? All right, let's -- he said that? All right, so let's stay focused, Max. You said you'll draw it for me? So draw it for me. Okay, so read it again. Those are two friends?

STUDENT: Yeah.

TAHEEDAH WREN: Okay.

STUDENT: They invite four people.

TAHEEDAH WREN: Each one of them or all -- both of them invited?

STUDENT: Each one of them.

TAHEEDAH WREN: Can you make a connection so I can see? Oh, I see. You have a beautiful -- good.

STUDENT: Okay, what I did. I drew Cindy as herself.

TAHEEDAH WREN: Mm-hmm.

STUDENT: And then she said she invited two people.

TAHEEDAH WREN: Are you guys focused?

STUDENT: I made a plus sign that equals two people.

TAHEEDAH WREN: Okay. Good. I see.

STUDENT: And those two people each invite four people theirselves. And then those people -- and those people then invite three people --

TAHEEDAH WREN: This person invited how many?

STUDENT: Four. And one other person invited --

TAHEEDAH WREN: And this person invited how many?

STUDENT: Four. So, this is eight people.

TAHEEDAH WREN: So, this is the four for this person.

STUDENT: Yeah. Four for that person.

TAHEEDAH WREN: And this is the four for this person?

STUDENT: Yeah, that equals eight.

TAHEEDAH WREN: All right.

STUDENT: Then those eight people each invited three theyself.

TAHEEDAH WREN: Okay.

STUDENT: So, that's how I got 35.

TAHEEDAH WREN: Oh, so you have eight, three groups -- eight groups of three, and they represent the people that each one of these invited? Because you have eight people here?

STUDENT: Yeah, because it says, "Cindy had a party. She invited two guests," which are those.

TAHEEDAH WREN: Yes.

STUDENT: "Her guests each invited --"

TAHEEDAH WREN: Yes.

STUDENT: "four guests." So, one, two, three, four. One, two, three, four.

TAHEEDAH WREN: Is -- Okay.

STUDENT: And then those guests each invite three guests.

TAHEEDAH WREN: Yes.

STUDENT: So, each one of those four people invites three people.

TAHEEDAH WREN: Great. Is there any way that you can label or show me what each one of these groups of people represent?

STUDENT: I know how to get them to be guests. Put "G" on it.

TAHEEDAH WREN: Good idea.

STUDENT: One, two, three, four, five, six.

TAHEEDAH WREN: Did you understand my question?

STUDENT: Um, no, not really.

TAHEEDAH WREN: Okay. So, you explained to me what each group of -- these group of people represent, but if I looked at this model, is there any way that I can look at and know who these people are?

STUDENT: No.

TAHEEDAH WREN: No other way? Well, you put -- Emma, is this Cindy? You put Cindy here. Who are these people?

STUDENT: The guests.

TAHEEDAH WREN: Whose guests?

STUDENT: The ones invited -- Cindy's guests.

TAHEEDAH WREN: Okay, so, can you label that?

STUDENT: So, "CG."

TAHEEDAH WREN: Okay, good. Good. Destiny, you starting the poster now?

STUDENT: Yes.

TAHEEDAH WREN: Okay. So, we're going to … Make sure you include Max's input when you start the poster. How we coming, Max?

STUDENT: All good.

TAHEEDAH WREN: All right. Let me come back.

STUDENT: All right.

TAHEEDAH WREN: Sidney's the first guess.

STUDENT: No, she's the first person that [inaudible].

TAHEEDAH WREN: Okay. Okay.

STUDENT: She invited two, which makes it three. And then --

TAHEEDAH WREN: Five, four, group -- What group are you? Group three? Group three, six inches. All right, I'm sorry.

STUDENT: And then those two guests equal --

TAHEEDAH WREN: Let me see.

STUDENT: And then those two guests invited four others.

TAHEEDAH WREN: Who are the two, who are the two guests that you're talking about that invited four? Oh, I see, and where are their guests? Oh, you put friends, nice! And labels. These are their guests?

STUDENT: Mm-hmm.

TAHEEDAH WREN: Okay, and then what happened?

STUDENT: And then, then the four guests, um, put three guests.

TAHEEDAH WREN: Where are they? Where are their three guests?

STUDENT: Right here.

TAHEEDAH WREN: One, two, three, yeah.

STUDENT: Their guests is right here.

TAHEEDAH WREN: Good, very clear. I see it. Good. And these guests? So, you have three from each?

STUDENT: Mm-hmm.

TAHEEDAH WREN: All right. So how did you come up with 35?

STUDENT: I counted them all.

TAHEEDAH WREN: You counted them, each guest to total 35? Is there another way we could have maybe come up with 35 without counting them one by one by one?

STUDENT: I don't know.

TAHEEDAH WREN: You think? Okay, first let's hear from you, Amy.

STUDENT: So, what I did --

TAHEEDAH WREN: Speak loudly. Who are the four people?

STUDENT: [inaudible]

TAHEEDAH WREN: Okay. Okay.

STUDENT: And then he invited three branches --

TAHEEDAH WREN: I see.

STUDENT: And then he invited three [inaudible].

TAHEEDAH WREN: Okay, good. Yeah, your arrows are clear, yes. And then he invited these three. So, the question asked, how many people were at Cindy's party?

STUDENT: 35.

TAHEEDAH WREN: So, 35 people at the party? You guys ready for your, um, poster? Ready to do your poster?

STUDENT: Yes.

TAHEEDAH WREN: All right, so when you do your poster, I want you to make sure you explain your thinking and follow all the steps that are on the board -- on the board as for -- as for the goals for everybody participating and show your work and show your thinking. All right?

STUDENT: Okay.

TAHEEDAH WREN: And definitely incorporate it. Good job! Love.

STUDENTS: L-O-V-E.

TAHEEDAH WREN: Raise your hand if your group has started the posters. Good job. How many have finished the poster for level A? All right. After you finish the poster for level A, raise a quiet hand and then we're going to go to level B. All right? Let's go. Good job boys and girls, though.

I wanted to see this very good work put on the poster. Okay? I can't wait to see it. Yes.

STUDENT: I finally got it.

TAHEEDAH WREN: What do you got?

STUDENT: It was confusing because it says -- Well, I automatically knew it was Cindy had a party and then she invited two guests.

TAHEEDAH WREN: Yes.

STUDENT: But then once it got here, her guests each invited four, and so my answer was 17 until, like, I got her guests each invited. So, then I had to redo it.

TAHEEDAH WREN: What helped you to understand her guests each?

STUDENT: Um, it, I like, so basically, I drew, I drew the guests --

TAHEEDAH WREN: That's the, that's the support. Drawing is very helpful. For me too, I have to draw figures or whatever so I can visualize, because I'm a visual learner too, I have to see it. And that helped you to see it. Did the group help you to go back or did you -- what made you go back to look at it again?

STUDENT: The group.

TAHEEDAH WREN: Okay, so the group is a very good support as well. But excellent job. You guys ready for your poster?

STUDENT: We already started on it.

TAHEEDAH WREN: Great, great job.

STUDENT: Cindy. That was one.

TAHEEDAH WREN: Is that – all right, good, so your modeling helped you to understand it. So, this is Cindy?

STUDENT: This is Cindy right here.

TAHEEDAH WREN: That's Cindy, okay, sorry.

STUDENT: And then she invited two friends. These are the two friends right here.

TAHEEDAH WREN: Okay. All right, good.

STUDENT: Those two friends invited four guests. So, I drew the four guests right here, those four right here, which is eight. So, then each of those guests invited three, which is right here.

TAHEEDAH WREN: Mm.

STUDENT: And then, then I added it all up. Cindy, 1 -- that's 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 -- wait. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34. What the? I'm not 35?

TAHEEDAH WREN: Did you include this one?

STUDENT: I probably counted wrong.

TAHEEDAH WREN: Did you include this one? So this is, this is Cindy, you said?

STUDENT: Mm-hmm.

TAHEEDAH WREN: These are her two guests?

STUDENT: Yep.

TAHEEDAH WREN: And where are their guests?

STUDENT: Right here.

TAHEEDAH WREN: Each one invited how many?

STUDENT: Um, three.

TAHEEDAH WREN: Cindy's guests invited how many?

STUDENT: Four.

TAHEEDAH WREN: Four. So, there's 1, 2, 3, 4, 1, 2, 3, 4, right?

STUDENT: Yes.

TAHEEDAH WREN: And then each one of her guests, each one of them invited how many?

STUDENT: Three.

TAHEEDAH WREN: That's 1, 2, 3; 1, 2, 3; 1, 2, 3; 1, 2, 3. So you have all the guests included, so perhaps you did make a mistake in adding. So, you want to try again? Count them again and see if you come up with -- so where'd you get 35?

STUDENT: That was before when I counted.

TAHEEDAH WREN: Okay, count again. So, what were you thinking?

STUDENT: So, then she invited these two people.

TAHEEDAH WREN: Yes.

STUDENT: And then after it said that these two people invited four people.

TAHEEDAH WREN: Yes.

STUDENT: So then 1, 2, 3, 4; 1, 2, 3, 4.

TAHEEDAH WREN: Yes.

STUDENT: And then all those four people invited three people. So, 1, 2, 3; 1, 2, 3; 1, 2, 3; 1, 2, 3; 1, 2, 3; 1, 2, 3; 1, 2, 3; and 1, 2, 3.

TAHEEDAH WREN: Okay, yeah, and let's see that. And so, then what did you do?

STUDENT: So then after, I added all of them, so then I add Cindy --

TAHEEDAH WREN: Yes.

STUDENT: And 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35. So that's how I got a total of 35.

TAHEEDAH WREN: So how would you write your solution down here?

STUDENT: Like, um ...

TAHEEDAH WREN: Beause they ask you, "Explain how you determine your solution." How would you write that?

STUDENT: Wait, them -- I would write that I like put like -- I would put like how I -- I would put 35 and then because, because since I counted Cindy --

TAHEEDAH WREN: Yes.

STUDENT: And then they invited two friends, so then you could just go like three, and then --

TAHEEDAH WREN: So just write down what you just explained in words. So, you might want to just use this space here, any space you like, you use the -- erase that maybe and put 35 here. And then write in that space how you -- explain how you determine your solution is beautiful pictures and very organized party members. Okay? And I like your tree concept too.

STUDENT: I have 35 again.

TAHEEDAH WREN: Okay. [laughs] So, very good.

STUDENT: Okay, so each are the guests and that's Cindy.

TAHEEDAH WREN: So, was your, your discrepancy in the counting? Did you miscount?

STUDENT: Yeah.

TAHEEDAH WREN: Okay. So, I need you guys once you write down on this paper, because I like to see your models on here too. I'd like for you to write -- explain how you determine your solution. And all your different steps that you tried, I want you to explain that too.

STUDENT: Okay.

TAHEEDAH WREN: Because that's important to see how you arrive -- how you started and then how you ended up with 35, all right? Uh, guests, 35 people at the party. All right? Thank you. Excuse me.

Yes, I gave it to him earlier. Good job, you guys. Is everybody participating?

STUDENT: Uh, Ms. Thornley came over here and said that they should start on level B and we do this.

TAHEEDAH WREN: Okay, perfect.

ANTHONY ROGERS: All right, so I want your desktops cleared because we're going to start our Problem of the Month. This Problem of the Month is called "Party Time." On your tabletops there are manipulatives, pattern blocks -- you can use them as counters. So go ahead, why don't you just start looking at your manipulatives now. I know you don't like playing with them, but go ahead and look at them now.

All right, do you think you're ready to go ahead or you need to sit? Hmm? All right, let me see. Where? Okay.

Give you your sheets. Do not start, just keep looking at the manipulatives. Do not start the problem.

If you hear me, clap twice. All right, so go ahead and leave them alone for now. Let's look at your Problem of the Month. Make sure you're sharing with a neighbor, so you're working with a person who sits perpendicular to you. Right? So make sure both of you are reading your paper. Actually, Tonya and Wanisha, all three of you use the one sheet together, but keep the two sheets, but I want you to do your work on one sheet, okay? All right, so make sure you're sharing with a person who sits perpendicular to you and go through your reading. You going to read upside down?

All right, the name of this problem, what is it?

STUDENTS: Party Time.

ANTHONY ROGERS: Party Time. All right. Lab away. Cindy had a party, she invited ...

STUDENTS: Guests.

ANTHONY ROGERS: She invited ...

STUDENTS: Two guests.

ANTHONY ROGERS: Her guests each invited ...

STUDENTS: Four guests.

ANTHONY ROGERS: And then those guests each invited ...

STUDENTS: Three guests.

ANTHONY ROGERS: How many people were at Cindy's party? Explain, *explain*, how you determine your solution. So, when you write out your explanations, you can use numbers, what else?

STUDENT: Words.

ANTHONY ROGERS: Words, and pictures, is that right? All right, so I gave you those manipulatives so you can look at it, right, from a different perspective. Go ahead and get started. Make sure you work together and explain your reasoning.

STUDENT: [laughing]

STUDENT: Okay, two plus eight equals ten. Okay, first I got that because she invited two guests and her two guests invited each four guests so 4 plus 4 is 8, and then 2 plus 8 equals 10. And so those ten guests, they each invited three guests, so 2 times 3 is 30, 30 times 3 is -- I don't really know.

STUDENT: Thir-- no.

STUDENT: Wait.

STUDENT: 30 plus 10, hold on, wait.

STUDENT: Because 2 plus 8 is 10, and ten of her guests -- those ten people -- four of her guests --

STUDENT: 10 plus 3 equals --

STUDENT: Yeah, I got, I got 16. And then plus our 17.

STUDENT: Because she had two guests, each guest invited four, right. Each invited four, and then those four guests each in--

STUDENT: So this is Cindy, and she invited --

STUDENT: Each of them invited three.

STUDENT: Yeah, that's what I'm saying.

STUDENT: Dang, that's not 17 then.

STUDENT: Well no, because look, shouldn't we count [inaudible], she invited four and then she invited three, and shouldn't we go two more?

STUDENT: Um, no. Because she each, she invited two guests. Two of her guests invited four, and then all four -- okay, so there's eight guests that her first two guests invited. Each of them invited three, so that means each of them would invite three. So that means 3 times 8 plus something times something. Plus 3 times 8, plus 3. I think. And 3 times 8 equals 24, so it'd be 27? What? I don't get that.

STUDENT: I know.

STUDENT: So you've got to add those people, plus all of these people --

ANTHONY ROGERS: So you have two and two here. But can you also use the manipulatives to demonstrate that?

STUDENT: Uh-huh.

ANTHONY ROGERS: So can you show me, what are we representing.

STUDENT: Her guests each invited four guests so --

ANTHONY ROGERS: So that's Cindy. And then -- all right, and Cindy did what?

STUDENT: She invited four people so --

ANTHONY ROGERS: She invited -- how many guests did she invite first?

STUDENT: Two.

STUDENT: Two.

ANTHONY ROGERS: All right, so where are the -- those are the models of the two guests? Okay.

STUDENT: So like, it's, then these invited ten, that's one person, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

STUDENT: Another one that is invited and those four people invited three. And three, so.

ANTHONY ROGERS: Okay, and then --

STUDENT: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. And then those 10 guests --

ANTHONY ROGERS: Okay, so where's Cindy again? And she invited two guests. And then they did what?

STUDENT: Invited four guests.

ANTHONY ROGERS: And then did those four guests invite anyone?

STUDENTS: Yeah.

ANTHONY ROGERS: How many people did they invite?

STUDENT: 16, 17.

ANTHONY ROGERS: And so, work that out together.

STUDENT: Yeah, 1, 2, 3, 4, 5, 6, 7, 8, 9. Wait. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Oh wait, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Those -- 1, 2, 3; 1, 2, 3; 1, 2, 3 …

ANTHONY ROGERS: Okay, so let's look at your model here. Where's Cindy?

Invited how many guests?

STUDENTS: Two.

ANTHONY ROGERS: Okay, so those two people just came, right with Cindy. So Cindy invited how many?

STUDENTS: Two.

ANTHONY ROGERS: And then those two invited how many?

STUDENTS: Four.

STUDENT: Four each.

ANTHONY ROGERS: And then those four guests invited how many?

STUDENTS: Three.

ANTHONY ROGERS: All right, so talk about your model. I like what you have so far. Talk about it.

All right, so show what you have here. Where's Cindy again? And where are her two guests?

STUDENT: She had 35 guests. You don't count the circles here because those are already counted up here.

STUDENT: 35.

STUDENT: Yeah. So are we going to write on your paper or mine?

STUDENT: Yours.

STUDENT: Guests invited --

STUDENT: Three?

STUDENT: Four guests, and then each one of her guests invited three more guests. Do you wanna do that? Just do the same thing, just do three boxes on each point.

ANTHONY ROGERS: You know what, Taja, we could go about it mathematically with number sentences, so one thing is maybe you could write the mathematics here?

STUDENT: [inaudible]

STUDENT: Okay, she has 35.

STUDENT: What 35?

STUDENT: Yeah. It's 34 but when you add Cindy --

STUDENT: I know I added Cindy --

STUDENT: Yeah, that's 35.

STUDENT: I got 34.

STUDENT: I got 35.

STUDENT: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 ...

STUDENT: I counted that.

STUDENT: I got 32 -- wait, no. Oh yeah, you get 35.

STUDENT: Cindy -- so this is Cindy, and she invited two guests, and those two guests invited four guests each. And the four guests invited three people. And, um, so we counted these, since there's eight of them then we count by threes so that 8 times 3 equals 24. And then you counted these, and that gives you 11, and so it would be 24 plus 11, and that equals 35. So there was 35 guests at the party. So that's all we do, yeah.

STUDENT: And we go like -- how would you …?

ANTHONY ROGERS: Count these out. All together?

STUDENT: One-fourth, one-fourth, one-half.

ANTHONY ROGERS: And how much is in a fourth?

STUDENT: Eight.

ANTHONY ROGERS: Okay. So, these are the boys here? What's this -- what's this group here?

STUDENT: The boys is right here.

ANTHONY ROGERS: Okay, these are the boys.

STUDENT: And these is the short hair and this is the long hair.

STUDENT: Yep.

ANTHONY ROGERS: Okay. So, if there were 32 guests, what is the maximum … So, what's the maximum number of girls who could have short red hair? Have you discussed that yet?

STUDENT: No.

ANTHONY ROGERS: So, based on what -- I like what you have here, but based on these numbers -- these are all the boys, you said, right?

STUDENT: Yep.

ANTHONY ROGERS: So, what are these two groups here?

STUDENT: This is the short hair and this the long hair.

ANTHONY ROGERS: Right. Okay, so these are girls …

STUDENT: They are both --

ANTHONY ROGERS: … with short hair.

STUDENT: Oh.

ANTHONY ROGERS: And these are girls with what?

STUDENT: Long.

STUDENT: Oh! Oh, I get it now. I get it now.

ANTHONY ROGERS: All right, so you need to talk about a number.

STUDENT: So, we know one-half is 25.

ANTHONY ROGERS: All right, well let's read it all on. Read it aloud, please.

STUDENT: At Leslie's party, one-half of the people had long hair. One-half of the people at the party were boys. One-half -- one-fourth of the girls had short blonde hair. None of the boys had blonde hair. If there were 32 guests, then what is the maximum number of girls that have short …

ANTHONY ROGERS: Short red hair.

STUDENT: Short red hair.

ANTHONY ROGERS: Short red hair, right? And what's the total amount of guests?

STUDENT: 32.

ANTHONY ROGERS: All right, so half of that group was boys. Is that right? Half that group is boys, and what number is that?

One-fourth of them had?

STUDENTS: Long hair.

ANTHONY ROGERS: Long hair. Can you write a little label on that one-fourth so I know what that one-fourth means? Because sometimes I get confused what all these fractions mean. So, that's one-fourth of all the people at the party?

STUDENT: Yep.

STUDENT: Mm-hmm. No, no. And then this fourth, that's for the girls who had short blonde hair.

ANTHONY ROGERS: Okay. Okay. So, why did you add those two fourths together?

STUDENT: Oh, but --

ANTHONY ROGERS: What are you thinking?

STUDENT: Um, okay. So, the [inaudible], does it still count? One-half of the people at the party who were boys. No wait -- one-half of the people at the party were boys.

ANTHONY ROGERS: So, my --

STUDENT: And then [inaudible], so maybe we need to add that into the problem.

STUDENT: No, wait, no, no, no. It says none of the boys had long hair, and this says, at Leslie's party -- it doesn't say girls. It just says one-fourth of the people had long hair.

ANTHONY ROGERS: So, why don't you in numbers see if you can figure out what this one-fourth is?

STUDENT: It is long hair.

ANTHONY ROGERS: How many people had long hair?

STUDENT: One-fourth.

ANTHONY ROGERS: One-fourth of what? How many people were at the party?

STUDENTS: 32.

ANTHONY ROGERS: So, what's one-fourth of 32?

STUDENT: Oh! You just divide the 32. What would you divide by?

ANTHONY ROGERS: I'm not commenting. Figure out one-fourth. You guys know I'm not going to answer that question.

STUDENT: That's with me, so this is eight, that is eight. And one-half of 32 is 16. Which is 16 --

STUDENT: 16 right there.

STUDENT: So, I don't understand how you got 4, 4, and 8 -- 18.

STUDENT: Okay --

STUDENT: So, it's 8.

STUDENT: But there has to be 16 -- Okay, 8, 8, and 16.

STUDENT: Yeah.

STUDENT: But what is -- So, the red hair is 8? Or 16?

STUDENT: The red hair is out of the question.

STUDENT: 8. It's 8.

STUDENT: The red hair is out of the question, because it's, like -- It says short red hair. And all of --

STUDENT: Wait, it says none of the boys have long hair.

STUDENT: So, the red short hair might be referring to the boys.

STUDENT: Yeah, so, none of the boys have long hair.

STUDENT: So, it's 16?

STUDENT: Nah, that's 8.

STUDENT: Wait, is that 16 or is this with 8?

STUDENT: We'll have to --

STUDENT: 16.

STUDENT: This is the long hair. That's all girls, that's 8. So, is this 16 or 8?

STUDENT: That one is --

STUDENT: I think this is 16.

STUDENT: That one's 16. Because we already have our 8 right here.

STUDENT: The problem says, "At Leslie's party, one-fourth of the people have long hair. One-half of the people at the party were boys." And half of 32 is 16, and one-fourth of 32 is 8.

STUDENT: 8.

STUDENT: And it's 2 one-fourths, so there's 8.

STUDENT: So, there's 2 fourths--

STUDENT: 8, 8, and that's 8 --

STUDENT: And so, that all equals 32 for the whole total.

STUDENT: The people -- the total of people with long hair, that's one-fourth. That's 8, and those are all girls because none of the boys have long hair. And the one-fourth of girls -- wait -- the one-fourth of people who have short blonde hair is 16, and the people who had red hair is 8. So, all together, that equals 32.

STUDENT: We just figured out the answers to the question.

STUDENT: We're on the second, um, second page.

STUDENT: We're on the second.

STUDENT: We're going to move on to the next one.

STUDENT: We're on level C.

STUDENT: We're on level C.

STUDENT: "Mia, Jake, Carol, Barbara, Ford, and Jeff are all going to a costume party. Figure out --"

STUDENT: Because, we learned that we had to multiply, so there we got 24. But we still don't know how they got 35, so we're going to try to figure out what's 35. What is -- yeah.

STUDENT: So, we're trying to picture it out and see so we can imagine it, so it'll be more easier for us.

STUDENT: It says one-fourth of the people have long hair, but then it says none of the boys have long hair. You get it?

STUDENT: Yes, yes.

STUDENT: But it says -- It doesn't say boy or girl, it says people. They just say people, but what kind of people?

STUDENT: I don't know, different kind of people.

STUDENT: So, then it says, one-half of boys at the party were boys.

STUDENT: Okay, one-half, so --

STUDENT: But then these aren't long hair, they have short hair.

STUDENT: Okay, short hair here.

STUDENT: Oh, it's -- it's three-fourths because look, I think -- I think this is -- you're supposed to add one, one-half, and one-fourth. Because it's short. Because they both have short hair, right?

STUDENT: But then half … Oh, I think it's four girls.

STUDENT: All right, this is one second. It's one-half, one-half, add one-fourth. Uh, 25 and 50. That's, um, 75.

So, we got [cross talk] with short hair, not long hair, because it doesn't say who has long hair.

STUDENT: So, that's 3/4.

STUDENT: Yeah.

STUDENT: And add 16, then divide 16 by 2, which equals 8. Then divide 8 by 2, which is 4.

STUDENT: Here. Four girls have short red hair.

STUDENT: The boys and the girls. There.

STUDENT: "Maya, Jake, Carl, Barbara, Ford, and Jeff all -- are all going to a costume party. Figure out which person is wearing what costume and when they arrive at the --"

STUDENT: I did number four. Okay, so, this should be easy.

STUDENT: Well, I don't remember [inaudible]. "The person that arrived fourth was wearing [inaudible]." Hold on. I've got to read that again. That was confusing.

ANTHONY ROGERS: You've figured out the number of boys and the number of girls. We've figured out the number of kids with long hair. The part I'm struggling with is how many have red hair.

STUDENT: The boys have red hair. Okay.

STUDENT: But we don't even know -- short red hair. Oh, so we … Okay. One-fourth of the guests --

STUDENT: Have short blonde hair, and none of the boys have long hair --

STUDENT: So, what about the other girls?

STUDENT: So, one-fourth of --

STUDENT: So, wait, we can do one-fourth, that would be the long hair -- the long hair.

STUDENT: One-fourth of the party had short hair. And one-fourth, plus one-fourth, once again, equals two-fourths. Plus two-fourths equals four-fourths, equals one whole. I think that's the answer.

STUDENT: And then six, and then --

STUDENT: 50 divided -- you put a division sign.

STUDENT: That's six.

STUDENT: Barbara, what's that? Oh, she wearing the bathing suit then, because she was the last to arrive.

STUDENT: I appreciate you for taking the time and helping us understand questions when we don't get it and having patience and -- when you teach it.

[snapping]

ANTHONY ROGERS: Thank you. Tanya?

STUDENT: I appreciate you for taking the time out of your day to teach us, so we can go to college and get a better education.

ANTHONY ROGERS: Thank you. Sabella?

STUDENT: I appreciate you for being nice to us and -- yeah.

ANTHONY ROGERS: Thank you.

STUDENT: I appreciate you for being a nice teacher and teaching us even though we have trouble.

SPEAKER: Nice and loud, please, nice and loud.

ANTHONY ROGERS: All right, thank you. China?

STUDENT: I appreciate you, because you my math teacher, and because you have patience to teach us.

[snapping]

ANTHONY ROGERS: All right, thank you. Darnell?

STUDENT: I appreciate you for teaching -- basically teaching us life, because math is life.

[snapping]

And I appreciate you for helping me when I need help and for --

ANTHONY ROGERS: Thank you. All right, Ameena.

STUDENT: I appreciate you at -- for helping us with math every day, for coming here, using your time to help us understand these problems that we need help with so we can learn math.

ANTHONY ROGERS: All right, Rachel.

STUDENT: I appreciate you for having the time to teach us instead of going somewhere else.

ANTHONY ROGERS: All right, Ariana.

STUDENT: I appreciate you for being a good teacher, for helping us when we have problems, and for being also a funny teacher, because if you weren't funny it'd be, like, a boring class.

[snapping]

ANTHONY ROGERS: All right.

STUDENT: I appreciate you for being nice and helpful.

ANTHONY ROGERS: Dante.

STUDENT: I appreciate you -- I appreciate you for -- I appreciate you for being funny, and I appreciate you for being hard on us, so we can go to college. And I appreciate you for bringing the camera people in here, so we can be on TV.

ANTHONY ROGERS: All right.

[laughter]

STUDENT: I appreciate you for being my math and science teacher. And wasting money for -- for us.

ANTHONY ROGERS: All right, Victor?

STUDENT: I appreciate you for coming every day and teaching us, because you know different stuff every day -- well, sometimes and --

ANTHONY ROGERS: All right, thank you everyone.

STUDENTS: You're welcome.

ANTHONY ROGERS: Thank you, [inaudible].

SPEAKER: Thank you. Thank you for [inaudible]

STUDENT: Are they still camera-ing us?

STUDENT: Bye, [inaudible].

[laughter]

SPEAKER: Anything about the mathematics that surprised you, in terms of what kids were able to understand or misconceptions they may have had?

ANTHONY ROGERS: I think level B, level B, there were a lot of misconceptions around “one-fourth of the girls at the party,” because the students often referred to one-fourth of the total people at the party. So, a lot of them thought that there weren't any people that could have short red hair. So, that, um, was very interesting. I think that as the -- as the math was ramped up in level D, like the probability and statistical reasoning for D and E, I think that was sort of complicated. I think just more mathematic and theoretical probability worked.

SPEAKER: Worked. For example?

ANTHONY ROGERS: For example, just, um, doing some more hands-on things. So, using the spinners to show probability, dice, and, like, bags. Like, there's an activity we used before where they have -- they have tiles in a bag, which is very similar to the problem. But I think they need more hands-on experience with probability, because it's very theoretical, so then they need to actually do things to see the probability a little bit more effectively.

I think the connection with art being a part of math, like, that's very successful with a lot of their charts this time. The charts are more colorful. [laughs] They have more pictures, but the pictures are very relevant to the work … Well, they're actually diagrams, they're not pictures. They have the specific information that they need. So, I think I see those more successful students understanding that art is math. And you can use it -- you can use diagrams to help you solve problems, and problems are not always solved just with number sentences and word sentences. So, I think that that's the most successful thing that I've seen.

I think the engagement level is higher when they have to work on the Problem of the Month. I think it has more entry points for all students. And as the math is ramped up, like in level C or D and E, there's sometimes less involvement, but overall, there's more involvement because it's nontraditional. And it's not -- they don't always have to use the basic algorithms that we've been teaching. They can use their own understanding and it's acceptable. And we're not dinging for, uh, errors or mistakes, but we're just looking for their understanding. So, I think all students feel a little more comfortable -- confident when they're working on the Problems of the Month.

The biggest challenges are refraining from using this as a teaching moment, and allowing the students to work through their own process. And, yeah. So, that's the biggest challenge for me.

SPEAKER: Allowing them to struggle with …?

ANTHONY ROGERS: Allowing them to struggle with the math and to work as a group, and, for me, not to teach during this time. So, that's the biggest struggle. It's also the biggest joy, also, because I get to see their own thinking a lot more.

I enjoy using the Problem of the Months. I think it allows the students to engage with each other. And school-wide, it allows all of the students to sort of engage and -- and have a discourse

around the math that everyone is doing. And they get to see other students' understanding and successes with the problems.

BROOKE MENARD: All right, hi, my name is Brooke Menard and I teach 5th grade here at Anna Yates. And my students partnered up with Ms. Miles' class, which is a kindergarten class, and we all took about a month working our Problem of the Month. And right now, we're getting ready to do a gallery walk, where all of the classes that participated posted their posters around. And so, my 5th graders are pairing up with the 1st -- or, kindergarteners, I'm sorry -- and they're going to go around and the 5th graders are going to explain what they did and their process of thinking with the posters. And then the kindergartners are going to explain what they did to my 5th graders. And my 5th graders have a list of questions that they could answer on sticky notes -- all the 5th graders have four sticky notes. So, along with their kindergartener partners, they'll go around and put like, maybe looking to see how students are thinking about the math, or what's challenging maybe about the math, or something that they really thought -- maybe they got a different answer than the poster did. So they'll write it on a sticky note. "Why did they get that?" or "How did they get that?" Different things like that. So, they're just going to be working together.

STUDENT: That one?

STUDENT: Mm-hmm.

STUDENT: You like it? How did you solve the problem?

STUDENT: I really like Problem of the Month because it teaches you new things and, um, where it says divide -- well, it doesn't really say divide -- but you have to think of the words to know the problem. Where it says "share," "share," and "share" means to divide, and "groups of" mean to times.

STUDENT: I notice about Problem of the Month is when you go to level A, it's easy, and then it gets harder and harder as you go. Because on level C I really didn't get it at first, but then when we did it in class together I kind of got it more.

STUDENT: I like Problem of the Month because it's like, it covers all the different parts of math. Like we do one packet for March covered geometry and there was multiplication and now it's problem solving with something -- it relates to what -- it gives us something that we can relate to. That's what I like about all the problems.

STUDENT: What I like about Problem of the Month is that when you start doing it and doing it you understand what the problem is asking you. And, um, on some of the times when we get to work with our partners, I actually focus more on the problem when I'm working with someone else.

STUDENT: Well, I really love -- I really love Problem of the Month but sometimes it can be difficult and sometimes it can be hard. And you might not understand it but the next second you understand what the problem is talking about. And, sometimes you need -- you need to go through it with your strategies, and sometimes levels can be hard but you just have to work through it and you might get it one day.

You feel awesome.

STUDENT: Because doing it all alone isn't helping me, so if I get help from a partner they could actually explain it more if I'm not getting it correctly.

BROOKE MENARD: Thank you for sharing that. Anybody else? These are all great comments. Yes?

STUDENT: When it gives us tricky problems and it -- in the problem sometimes you don't -- don't notice that it -- it gives -- it gives you multiplication, division, and all other methods that you can use to solve the problems. And, and one strategy I use most of the time is dividing and usually helps me when I draw pictures.

STUDENT: I can learn new things every time I get a different packet.

BROOKE MENARD: Like what?

STUDENT: Like, multiplication and how to divide and parties and things.

BROOKE MENARD: Mm-hmm, somebody else? What would you like to say?

STUDENT: Well, I like Problem of the Month because sometimes it's really difficult. It's really difficult at first but then when we do it all together, I start to get it some more.

BROOKE MENARD: You like that challenging aspect of it?

STUDENT: Mm-hmm.

STUDENT: This is fun because we get to read all of the posters. All our posters.

STUDENT: -- party eight and they all have to go to some party, so --

STUDENT: Oh, you mean the party?

STUDENT: Yes -- no, no this is somebody else's, but it's the same one.

STUDENT: How many people came?

STUDENT: Do you have a question about this one? What's your question? Eight?

STUDENT: Okay, what do you see in the circle? Huh? Words? What else do you see? I see fractions.

A fraction is when something is divided into equal or nonequal parts.

BROOKE MENARD: Okay, could you show him what a fraction is? What equal parts are? What those equal parts are? So, example, what is that part with the boys? How much is that?

STUDENT: Right here, this is a half, which equals to 50%. And then right here is one-fourth of the other, of the whole circle, is one-fourth. And here's another one-fourth and then that -- and

then you together the 2 one-fourths. Um, so, there's 4 one-fourths equals a whole, which also equals to one-half.

STUDENT: So, so --

STUDENT: So, 4 one-fourths equals a whole --

STUDENT: It's a half.

STUDENT: Plus this half, and it equals a whole circle, and then it equals a 32, and that's the answer. Get it?

STUDENT: See, five people invited four people, and each of them invited three people, and over here they invited three people, they added these people all up plus her is 35. You had any questions about this one?

STUDENT: No.

BROOKE MENARD: Can I take you guys' picture? And you stand in front of the poster?

STUDENT: Okay, come on, come on.

STUDENT: Okay, so it says --

STUDENT: No, no, no, no, no. This one.

STUDENT: Oh, wow this is the --

STUDENT: Okay. So, Cindy, she invited them. They invited three people. Four, five, six. Then she invited one, two, three, four, five, six. And you put all these and put together six add plus three plus six equals nine. Then, they showed they work to explain how they got that. They did three, three, three. Three plus three, six, equals one, two, three, four, five, six, seven, eight. It equals eight. Three plus six equals eight, so that's how they got the answer. And this one, do you get this one? Explain why.

BROOKE MENARD: Speak a little louder.

STUDENT: Cindy invited Clara, this one, this one, and --

BROOKE MENARD: All right, one, two, three, let's go.

STUDENT: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 --

STUDENT: I learned that I want to be a good 5th grader.

BROOKE MENARD: You learned you want to be a good 5th grader.

STUDENT: I know.

STUDENT: -- must have the problems because if there wasn't any equation how can you tell how they got their answers?

BROOKE MENARD: So, what equation helped you? Is there an equation in particular?

STUDENT: Um, no -- but, yeah, there is. Because her people invited they people --

STUDENT: I'm sort of like curious with theirs when they did level A because I know that they didn't get to finish it but I like because -- I like theirs because they had all these different kids in different postures and everything.

BROOKE MENARD: Different kids in different postures? And did that help you?

STUDENT: Yes.

BROOKE MENARD: How?

STUDENT: Because if I see different kids in different postures, I can see that all the people that they invited and I can count all the different people.

BROOKE MENARD: Thank you.

STUDENT: One of the -- speaking of [inaudible] and I put that because I got a different answer instead of 32, and then I put it there because I didn't know -- I didn't know how they got that answer.

BROOKE MENARD: So you asked them about the question, you put it on the sticky note. Thank you.

STUDENT: I put, um, what did Amari not get and what he did get, and if he didn't get it I explained it to him very carefully step by step to make sure he got it.

BROOKE MENARD: So you actually wrote a comment explaining the mathematics a different way --

STUDENT: Yeah.

BROOKE MENARD: -- on your sticky note?

STUDENT: We did it different, we actually drew the people.

LESLIE THORNLEY: Okay, so, explain the pie to me. What are you seeing?

STUDENT: Well, I can't tell, because they didn't really explain the answer that much, but they put like one-fourth people with long hair, one-fourth girls had short blonde hair, one-fourth had short red hair, one-fourth -- and there's eight girls and sixteen boys.

LESLIE THORNLEY: So, can you tell from their poster how many kids had the red hair?

STUDENT: Kind of, yes. Four. Well, it says one-fourth.

LESLIE THORNLEY: It says one-fourth, so what's -- what's the one-fourth referring to, one-fourth of what number?

STUDENT: Of … 32 people.

LESLIE THORNLEY: Okay. How did you solve the problem?

STUDENT: Well, we actually um -- I gotta check mine.

LESLIE THORNLEY: He said one-fourth of 32. He said this one-fourth stands -- is one-fourth of the 32 people that went to the party. Do you agree with that? Disagree? Give me some signals.

STUDENT: I say -- how could it be half because four-fourths is one whole, so I say how would that be half?

[snapping]

LESLIE THORNLEY: I hear some snaps. So how could what be half?

STUDENT: Like the top, because it says a fourth, a fourth, a fourth, and a fourth. So that should be a whole. And um, two of those should be half. So, that’s what I think.

STUDENT: My questions is that it has like two things like, um, with like girls with blonde hair and girls with red hair, they have both short hair and then it only says one-fourth has short hair.

STUDENT: To me, the poster, they should've added the story to the poster so that people can understand it. And like, the people who never did learn the poster, what is the meaning of it -- they should have wrote down the story to understand the answer about it.

LESLIE THORNLEY: This four-fourths is representing what?

STUDENTS: One whole.

LESLIE THORNLEY: One whole group of?

STUDENTS: 32 people.

LESLIE THORNLEY: Is this the boys and the girls or everyone?

STUDENTS: Everyone.

LESLIE THORNLEY: How about the fourths?

STUDENTS: Girls.

LESLIE THORNLEY: So, this is just the girls. So, this whole, this four-fourths, would be the total number of girls.

STUDENT: But I knew that one was kind of different. It showed me like different steps and diagrams how to do it. Like, they broke it apart in like bar graphs and they wrote how each step they did.

They showed each answer and how, like what -- who has short hair and who has long hair. They go through the part and they show each step, and even though we didn't do a poster, but the way be solved it might have been kind of different, but it's shown a different way.

LESLIE THORNLEY: But take thirty seconds and talk to me about the difference between this poster and this poster over here. Now, I know the words are really small so I'm just going to talk about this for a just a minute. This is labeled "girls with hair," this is labeled "girls with short hair," and this is labeled "the boys." This says 8, this says 4 and 4, and this says 16. How, how does this relate to this poster? Is this clearer to you? Less clear? If so, why?

STUDENT: Less clear because it only has like three diagrams of a fraction table or … And then, um, like because for 16 it has like one-half of a circle, which makes it confusing.

STUDENT: There's two pie graphs with girls and just a half of a pie graph with boys.

LESLIE THORNLEY: Girls with long hair, this is the girls with short hair, and this is the boys. Knowing that, does it change how you're looking at that, the math?

STUDENT: I don't really get it because there's eight girls and the full circle is filled but when it says 16 boys, there's only half of the circle filled. But like, there's -- 16 is more than eight.

LESLIE THORNLEY: -- part of the, this pie graph, what would you label it?

STUDENT: I'm not sure.

LESLIE THORNLEY: This is what we're going to do, is we're going to walk around the room and we're going to first have no talking, okay, and just walk around and look at the posters. And then I want you to find one poster all by yourself, one poster, and answer two of these questions on the back of this paper. So, why don't you look the questions over right now and maybe pick a couple, just circle. Just circle the two questions that you're interested -- that are interesting to you. That you might like to respond to in looking at the posters.

STUDENT: -- um, presented, would you like to explore further, the last one.

LESLIE THORNLEY: The last question? What mathematics presented would you like to explore further? Kind of a fancy question, huh?

STUDENT: Which poster do you want to, um, the, explore more, like if you find a poster that you really want to know what it's about you can go and write which one it is.

STUDENT: Cindy had a party. She invited two guests. Her guests each invited four guests and then those guests each invited two guests. How many people at Cindy's party were there? There were 35 people at Cindy's party. Okay.

STUDENT: Brea.

LESLIE THORNLEY: Brea, sorry, forgot. Somebody wrote some comments on your poster?

STUDENT: Yeah.

LESLIE THORNLEY: What did they write? What are you thinking about it?

STUDENT: Um, I'm really curious about this one because I thought that Superman --

LESLIE THORNLEY: What's that one say?

STUDENT: "Carol is in the bathing suit dot, dot, dot, I think."

LESLIE THORNLEY: And what are you thinking about that question?

STUDENT: I really thought that Carol was in the Superman, and that's what my partner thought. Her name's Asia, but she's not here. Yeah, that's what I thought.

LESLIE THORNLEY: So, you want to study it some more and think about it? Or do you think there are -- are you wondering about whether your answer is correct or not?

STUDENT: Yeah.

LESLIE THORNLEY: So why don't you just talk aloud and tell me what's going through your mind right now.

STUDENT: Well, I'm actually curious about my partner's one, because this one just says Mia and Jake is Potato Heads, are Potato Heads, but what my partner thought was the French maid was Mia because she thought that a girl couldn't -- no, a boy couldn't be a French maid, but I thought the French maid was Jeff. That was the whole entire question that I was trying to figure out.

LESLIE THORNLEY: So, where's your thinking, where's your poster?

STUDENT: Right here. That's my side, that's my partner's side.

LESLIE THORNLEY: That's your side, so why don't you explain your side to us?

STUDENT: Okay, so what I did is I wrote the facts all the way up there, and the facts are like really good but the one that troubled me and my partner the most was the one that said, "Jake and Mia arrived and stayed together," and the one that says, "The Potato Heads were always together at the party." So, I thought the Potato Heads were Jake and Mia.

LESLIE THORNLEY: Well, maybe they are. Are you rethinking it or what --?

STUDENT: No, actually, I'm trying to stick with it because if Jake and Mia arrived and stayed together and it says the Potatoes Heads were always together at the party, then that means that Jake and Mia must be the Potato Heads.

LESLIE THORNLEY: So, you're thinking that your rationale makes more sense than this one here.

STUDENT: Yeah.

LESLIE THORNLEY: Okay. And then cutting back to the French maid, even though your partner had Mia, and you had Jeff, tell me why you put Jeff and if you're still comfortable with that answer?

STUDENT: I'm still comfortable with the answer because, um, everyone else were, had a part except for Barbara and Jeff. So, it said … The first clue was that the -- um, not the first one, but was Barbara was the last to arrive, so I put her as six and the only costumes that were left after I did that was the vampire. So, I thought Barbara was the vampire and Jeff was the French maid because he didn't have a costume yet and everyone else did.

LESLIE THORNLEY: Okay, so getting back to this sticky, which you started talking about, Carol is in the bathing suit.

STUDENT: Yeah, my mom actually --

LESLIE THORNLEY: What do you think?

STUDENT: ‘Cause if Ford is the surfer dude and Carol is in a bathing suit, I don't really think she's in the bathing suit. I think Ford is the surfer dude and he's like in, like stretch pants.

LESLIE THORNLEY: [laughs] So, what convinced you that Ford was the surfer dude?

STUDENT: It told, the facts told us, it says Ford was surfer dude.

LESLIE THORNLEY: Okay, and we're just going to put him in stretch pants instead of a bathing suit.

STUDENT: Yeah.

LESLIE THORNLEY: Okay. Anything else you want to tell us?

STUDENT: Yeah, um, it was really hard when I had to figure out the numbers, because right here all of these numbers I had to figure out from the costumes in the -- who was what, so I had to do the who, then the costume, and the last thing I did was the number.

LESLIE THORNLEY: So, you first figured out who was whom in the costumes and then what order they arrived at?

STUDENT: Yeah, because it was pretty hard when they said -- when they were talking about Ford and Carol.

LESLIE THORNLEY: So, you're confident with your order? Or do you want to change anything?

STUDENT: Mmm, I'm confident.

LESLIE THORNLEY: Okay, thank you.

LESLIE THORNLEY: So, what were the questions, and what were you talking about in whispers? You can go ahead and talk out loud.

STUDENT: Well, one of the questions right here is, "I noticed that they use pictures, numbers, and words to help them with the problem." And this one says, "What was hard?" And this one is, "I love the diagrams."

LESLIE THORNLEY: How does it feel to have people commenting on your work?

STUDENT: Good.

LESLIE THORNLEY: What's good about it?

STUDENT: People like our work.

LESLIE THORNLEY: How about you? How does it feel to have people commenting on your poster?

STUDENT: It kind of feels good to me, because, like, usually I'm not really doing posters. Like, I'm not -- I kind of like to, like, draw and stuff. So, I'm not used to doing it on a poster, but seeing people comment -- the poster, that my group did, it kind of -- it kind of feels good to me.

STUDENT: What did you find mathematically interesting? Which is -- One, two, three, four, five, six. Bullet point number six.

STUDENT: I did the same. See.

STUDENT: Two of the same one.

STUDENT: Yeah.

STUDENT: Uh-oh.

SPEAKER: Can you show me that on the poster?

STUDENT: It was this one. We did this one.

STUDENT: What I found interesting is that ... that the pictures look very nice, and I like the way they explained who is who.

STUDENT: Mine is -- I did “what did you find most interesting” too, and I really liked how they did all the artwork, but at the same time, they really -- through the whole poster, they gave their thinking, even through the artwork.

STUDENT: What I found interesting was how they knew when they -- when each one arrived.

STUDENT: I like how they wrote it. They say, "How Dev, Damien," like, all the regular [inaudible] are on the side, and they did the costumes on the other side. And I really like how they did the pictures, how they did it in, like, how they show who came first and stuff like that.

LESLIE THORNLEY: So, Brea, I saw you writing some notes about this Level B poster. And I'm curious about what you were writing about, what you were thinking.

STUDENT: Well, all of these posters actually say the same thing over and over again -- and how they got 32. And I think I have a pretty good idea how they got 32.

LESLIE THORNLEY: Okay.

STUDENT: Okay, so here's all the boys, but we're not really worried about the boys. But girls. Okay, so, in it they had …

LESLIE THORNLEY: Go.

STUDENT: … had red hair. They were trying to figure out how many girls had red hair, but everything else -- I got eight too, and so the girls with long hair had one-fourth -- it was one-fourth. And four times four. So, if this is all four -- one, two, three, four. That's four. Times four is 16. And 16 plus 16 is 32. So, I was thinking that they just broke 16 into fours.

LESLIE THORNLEY: So, the 16 is actually being broken into fours.

STUDENT: Yeah.

LESLIE THORNLEY: Not the 32.

STUDENT: Yeah.

LESLIE THORNLEY: Okay, so if we're talking about the 16 being broken into fourths, how many girls would be in each section?

STUDENT: So, here there would be --

LESLIE THORNLEY: If they were equal.

STUDENT: Here there would be four, four, four, and four. So, they told us about these two, and it was one-fourth, so that's eight, so we're actually just studying on this half. So, we're gonna block this half out.

LESLIE THORNLEY: Okay. So, when you say, "Block this half out," you're saying that if these two fourths together are actually one-fourth of --

STUDENT: Yeah.

LESLIE THORNLEY: Of what?

STUDENT: Of 32.

LESLIE THORNLEY: Okay.

STUDENT: 'Cause eight times four is 32. And four plus four is eight. So, they're in the -- In the passage, they had already told us about how many had long hair and how many girls had short

blond hair. So, what we're really trying to find out is how many girls have red hair and how many girls were left over. And if there's -- Okay, so if they said half of the people at the party were boys, so when they say, like -- So, if we just cut all this out. Like, there'd be [inaudible] something with these and those, we could just have those two over there. And if you break them up -- 'Cause if you put both of those together, that'd be eight.

LESLIE THORNLEY: Both of these fourths would be eight together?

STUDENT: Yes.

LESLIE THORNLEY: Okay.

STUDENT: And half of eight is four, so the girl could add up into four. And, um, there was eight girls left over, and half of eight is four. So, that's how many had red hair, and that's how many had long blond hair.

LESLIE THORNLEY: Thank you.

STUDENT: And four plus four is eight. And that's how they got eight girls. And the 32 is how many people there were. So, all of this here, all of these girls and boys, equals 32.

LESLIE THORNLEY: Wonderful explanation. I liked the way that you talked out loud, and I could really understand your thinking about this diagram, the numbers, and the fractions. What do you think about this representation of the data? Did it help you? Did it confuse you?

STUDENT: Actually, when I first looked at this, I'm like, wow. These -- And I read all the post-its first. I'm like, wow. All of these post-its say the same thing. "Show your work." "Show your work." Like this one, it says they didn't show their work, and I found a ton of them that said, "How did you get 32?" and, "You didn't show your work." But actually, I think I know how they showed their work with this big old pie.

LESLIE THORNLEY: Thank you, Brea.

SPEAKER: Thanks, Brea.

JAGUANANA LATHAN: So, as a school, we've been focusing on critical thinking and, um, and math. And looking at student work and actually listening and hearing students explain their thinking.

LESLIE THORNLEY: What kinds of activities have the staff been involved in to -- to make that a focus in -- in terms of what -- what's being evidenced in the student work and the teachers' understanding of critical thinking?

JAGUANANA LATHAN: Right. So, students actually explaining their thinking, use -- being able to use pictures, words, diagrams, at higher levels. Are students able to apply what they've learned from the content in, in everyday, um, work and in their mathematics work?

LESLIE THORNLEY: How is this different than the -- the focus from previous years?

JAGUANANA LATHAN: Well, I think the focus from previous years was basically trying to build to get to the point where we are now. We have a lot of growth to go, but, um, it was some "drill and kill," the math program that we had. Teachers were learning at that time how to engage students more in their -- in their thinking. And so, we're at a point now where that's more of a focus. There's no more "drill and kill." It's more, um, based on content, content knowledge. And how are students able to understand the mathematics? How are they able to explain the mathematics?

LESLIE THORNLEY: What have you seen as a result of mathematical professional development in your teachers?

JAGUANANA LATHAN: Content growth has been a big one. You go into the classroom and you can tell that teachers are really understanding the math and able to give that -- pass that information on to students and help students understand the content of the math. I've also seen a shift in pedagogy. The approaches that teachers are using are, um, more engaging for the students. There's a lot of research-based practices that foster inquiry for our students. Teachers are more confident in their ability to deliver lessons. So, when I walk into a classroom, it's -- it's no more, you know, nervous looks, you know, that "I don't really understand this." Where teachers are confident that they can go on and build off of what they already know. And they're helping their students explain and defend their thinking. The teachers are really modeling their thinking of the math, and therefore, the students are able to do that with their peers. And, uh, another thing are -- is that teachers are considering their self -- their selves learners now.

LESLIE THORNLEY: What specifically are you seeing in the classrooms that's keeping the kids more engaged in the mathematics?

JAGUANANA LATHAN: I see students working together in teams, doing a lot of pair-shares and, um, even [inaudible] sometimes. It's really the other partner listening to what the student is saying. And students getting -- using -- students working in groups is a big one, using chart paper.

LESLIE THORNLEY: What the kids are doing in terms of their -- their own content growth and understanding, what kind of shifts have you seen? And what do you attribute those shifts to?

JAGUANANA LATHAN: I think students are more confident in explaining their thinking.

They have more --

LESLIE THORNLEY: Go ahead.

JAGUANANA LATHAN: -- of a background of the content now. So, they're understanding the big idea. And if they don't understand the big idea, they're willing to work with partners, work with their teachers, in digging into the content so that they can understand it.

LESLIE THORNLEY: So, good morning.

TEACHERS: Good morning.

LESLIE THORNLEY: Some of you have had an opportunity to introduce this problem and some of you haven't. So, we're going to revisit that experience here in a minute. But for right now, I'd just like to kind of pose the question to you, why did you guys pick the problem that you did?

ANTHONY ROGERS: It's fun.

AUDREY MILES: It's fun.

STACI CARIGNAN: It's about a party. Who doesn't like parties?

ANTHONY ROGERS: And the students can really connect to a party, and I like it because they can use, um, visual models with it, they can grasp this mathematical concept a little bit simpler than other problems.

TAHEEDAH WREN: And honestly? We're working on fractions as part of our curriculum focus, so that's one reason I wanted to work on this particular activity.

AUDREY MILES: And kinder is more dealing with the graphics, on how to look at something and -- and be able to count it, so looking at something graphic.

ANTHONY ROGERS: And the percent of the number.

STACI CARIGNAN: And it lends itself to critically thinking about real-life situations that the kids are going to encounter. So.

TAHEEDAH WREN: They all like parties, so that was when --

ANTHONY ROGERS: [laughs] Yeah.

TAHEEDAH WREN: The leveling point, so it was good.

ANTHONY ROGERS: Yeah.

TEACHER: There's not one obvious way to solve it; it's pretty open-ended. You could use a lot of different strategies.

TAHEEDAH WREN: And you know, it was comfortable in terms of no wrong answers. We didn't look for answers so much as we were looking for their thinking and how they approached -- you know, trying to understand what they were, uh, asked to do.

ANTHONY ROGERS: And all students have access to the problem, regardless of their -- the level.

TAHEEDAH WREN: That's right.

LESLIE THORNLEY: Can you speak more to that?

ANTHONY ROGERS: Well it's … with the first one, like Level A for example is just, "Cindy had a party and she invited two guests." So, it -- it sort of scaffolds itself to higher thinking and critical thinking, so all students have an access to the problem from the beginning.

TAHEEDAH WREN: And my groups have students from different levels, so when they work with their group and some of the students that are stronger in concept -- conceptualizing the problem, those that are struggling have an opportunity to check their work and give feedback on what they're doing and they can either adjust or ask questions. So.

AUDREY MILES: And for me there was some level of vocabulary building because I have an ELD level and I also have a couple special needs issues that need addressing. So, we did some preliminary work to address vocabulary ahead, and then we used the model while we were actually demonstrating and wanted to show it. So, I thought that was effective and they -- they seemed to be engaged, which was the big piece for me.

TAHEEDAH WREN: Oh, yes.

ANTHONY ROGERS: And a lot of them kept looking to see if I would correct their work or they wanted to know -- they wanted me to okay that their work was okay --

TAHEEDAH WREN: Oh, yes.

ANTHONY ROGERS: But I wouldn't, and I told them just to -- after they had thought they solved the problem, I would have them build the problem on manipulatives just so they can see it better, and they were able to self-correct from there.

LESLIE THORNLEY: This is kind of a nice segue into my next section, because you -- you taught it to your first period class, and we're going to see you a little while with your second period class. So, um, in terms of the scaffolding and some of -- like I said, some of you have done it and some of you haven't. What kind of scaffolding decisions did you make and why in terms of how to introduce the problem, and what misconceptions or problems are you anticipating, or did you anticipate?

AUDREY MILES: [laughs] The funny one was, I forgot the mirror. Because when you're standing to the front of the board, it shows as a different direction, and so you have to be -- when you are visually showing something to kindergartners you have to remember to turn it around. So, if I were to do that again, I would make sure that I was actually showing the model correctly, because at some point, they had a little problem with um -- modeling what I was doing. And I probably would have totally completed the graphics first that we did with the actual people because we had little people that we had adding to the party, then explained totally, and then went back and had them do the model.

LESLIE THORNLEY: And I'm going to cut you off a little bit because you are beating yourself up.

AUDREY MILES: Mmm.

LESLIE THORNLEY: And you did a superb job today. And we just want to -- absolutely superb job. And she's already modeling this great self-reflection that you guys do so brilliantly in your work. So, just focusing on the mathematical thinking that the kids might have a hard time understanding.

TAHEEDAH WREN: For my students, the think time was important. Allowing everyone their own time to read and, you know, go back over it and understand the question within their own time. So allowing everyone their own few minutes to look at the problem was very crucial for the students to -- at different levels to understand and work the problem. And then allowing them an opportunity to work when they were ready to go into the group that was moving a little ahead when they understood the problem was important. So that was one scaffold that we, uh, we planned into the instruction.

STACI CARIGNAN: I'm anticipating some challenges when we start on Monday with Level B and splitting them into fourths. So, that's something that we've really started to hit hard in my class is fractions and beginning fractions, especially halves and fourths. And really remembering that if you're breaking something into fourths, you're breaking them into four equal groups. And some of my kids are still struggling with that concept, so I think one thing I might want to do is definitely have -- I definitely want to have the manipulatives out, so they can actually start off with 32 guests at the party and then start rationing them off for -- you know, half are boys, half are girls, and start pulling from there. I anticipate that to be a little bit of an issue for some of my kids. Especially my EL kids.

TAHEEDAH WREN: You would give them 32 counters, or just a random number?

STACI CARIGNAN: I think I'd just give them a random number. I'd just put out, you know -- I have six groups, so six big buckets of counters and then let them pull from there.

TAHEEDAH WREN: Mm-hmm.

LESLIE THORNLEY: Any other comments or …?

TAHEEDAH WREN: I try to group my students that, you know, have behavior issues with, um, friendly partners. And in some cases it didn't work, but that's what happens every day, so that was a good, you know, representation of what's going on in Ms. Wren's class. But -- in respect to those students that need a little more support, we allow them to move about, and Ms. Thornley assisted with one student, and I realized a lot of things were going on that I didn't see, but that happens in the classroom.

[teachers laugh]

ANTHONY ROGERS: For Level D and E, I just -- I think some of the students will -- because the critical thinking is ramped up and I can see them struggling a little bit with D and E. Especially some of my students who take, like with E for example, they take, like that question, I

will see them taking that really literally and getting stuck on what the conversation is about in that problem versus the mathematical part, so I anticipate that.

AUDREY MILES: Even the last time I said I didn't want to try past B. I think for me B is harder than C and so I want to try C and actually dress my kids up and have them do it, and see if we can figure it out. Yeah, I think that would be fun to do that and that's --

ANTHONY ROGERS: With the French maid [inaudible]?

[teachers laugh]

AUDREY MILES: I would actually want to try this one on -- and do it as a visual, but no, I'd think we'd have to have a conservative French maid, thank you very much. But uh ... [laughs]

[teachers laugh]

LESLIE THORNLEY: So, you've all been involved in engaging with Problem of the Month this year starting with our summer coaching institute, and then we got a chance to work and collaborate as a team at the district retreat. So, I'm just going to just kind of step back for a minute and talk about -- have you speak to why you have chosen to make this a focus for you this year, and, um, how has it been working together -- we meet once a month -- and just what your personal experience has been with taking this on.

STACI CARIGNAN: Well, I chose to continue to do Problem of the Month despite all of the challenges I think we've had this year, you know with moving and new curriculum.

TAHEEDAH WREN: That's -- yes.

[teachers laugh]

STACI CARIGNAN: And moving again.

AUDREY MILES: Moving the curriculum.

STACI CARIGNAN: But I chose to continue on with it because I really like the way the problems are worded. I really like that it's a real-life situation and it's something that the kids can get into and they can see themselves in that situation and having to solve this real-life problem. And -- I mean, I can find word problems, I can write word problems, but not like this. It forces them to think a little bit deep -- not a little deeper, it forces them to think critically about their math, and think critically about how the math affects them. Um, and yeah, there's been lots of challenges and lots of scheduling issues this year, but I think the fact that we take time out to do it is really helping my kids to see math in a whole new way. At least that's the hope, and that's the goal. That's what it feels like.

AUDREY MILES: And not the whole drudgery piece of the way we were trained to think about math, because the kids love when we say, "Problem of the Month." They are so enthusiastic, and then when we get to the end of the month and we have that opportunity to go through the gallery walks and talk -- they love seeing the way things are presented by other students and --

and just hearing them talk about the math. And when we send it home, the parents are going, "I like that. I did it with my kid." And the parents are becoming part, so that sense of community-building when the problem actually goes home is just wonderful also. So, all of those moments.

TAHEEDAH WREN: For my children, if I don't do it, they'll remind me, "Ms. Wren, when are we going to do the Problem of the Month?" So because of the scheduling issue that you spoke about, and other -- you know, issues that we deal with, I try to do at least 15 minutes a day or 30 minutes every two days so that they can have what they want, because they enjoy working in groups, they enjoy doing the visuals where they can show their work and they can do their artwork and they like working together, you know, overall. So, it's something that they remind me to do if I don't, and I enjoy seeing them developing understanding, showing their work, and showing their thinking on a visual level, and so it's a support. It's a win-win.

TEACHER: And I feel that the Problem of the Month allows there to be a questioning period in their mind, for weeks on end. I think maybe in our regular math time where students find out the answer within the period. I mean we're -- that's sort of what we end up leaning towards is making sure the people understand it and have the right answer. But here, you're left in this equilibrium period for a few weeks and then you have to learn from each other by the gallery walk. So I feel like it's actually a good -- it's a good template for us as teachers to learn about teaching, this -- this process. I mean, if we could transfer it also to other subject areas it would -- it would be an interesting thing for us to do.

TAHEEDAH WREN: One thing that I'm going to do differently is change my groups into more heterogenous groups and have them rotate so that they'll have an opportunity to work with different groups instead of their own seating group that I put them in. So just looking at some of the dynamics today, I'm like, "Okay, we're going to make some changes," and let everybody work with different groups and see how that looks.

ANTHONY ROGERS: My students, whenever I write -- I don't even write out the words "Problem of the Month," I just put POM --

AUDREY MILES: POM, that's what I do.

ANTHONY ROGERS: -- as soon as they come in, they're like, "Look! Look, Look, Look!" And so they're really excited about it, and I think it allows them to -- to do deductive reasoning and um, to think about math at the same time. There's no right or wrong answer. I think the students are more relaxed and more comfortable to share their ideas because they know that I'm not going to grade it, and they know that it's not as weighted. But it is more fun for them and they know it is mathematical at the same time. So, I enjoy that and I like the way they enjoy it. I go to the institutes because I learn different ways of solving math problems, and then I learn the areas where I'm stuck.

[teachers laugh]

And I learn the areas where so many other teachers are still kind of struggling with math as well, so I feel a little bit more comfortable and always gain new insight every time I go, every time.

And I feel like it's definitely affected my practice. It's made me a better mathematician and a better teacher as a result.

LESLIE THORNLEY: You're still working with the mathematics yourselves.

TAHEEDAH WREN: Yes.

LESLIE THORNLEY: And engaging in the math yourselves.

TAHEEDAH WREN: First.

LESLIE THORNLEY: As learners, has been pretty key and critical.

TAHEEDAH WREN: Definitely.

AUDREY MILES: And we get the same conversations that we hear with our kids when we were at the table getting those aha moments, "Oh! Yeah, look!" You know, and sharing what you found, and sharing ideas and establishing our norms and also teaching our children to establish norms with each other when they're working together so that they feel comfortable about um -- sharing their math and their mathematical ideas.

LESLIE THORNLEY: Well, for the sake of time, [laughs] I need to send you all on your way, but I first just want to thank you very much for your time and once again, it is an absolute honor and privilege to work with all of you.

TEACHER: Thanks.

LESLIE THORNLEY: Really, it is.

ANTHONY ROGERS: Thank you.

LESLIE THORNLEY: I'm very lucky, very, very lucky. So those of you we haven't had a chance to see, we’re going to see later on, and thank you.

TAHEEDAH WREN: You're welcome.

LESLIE THORNLEY: Thank you for your time.