Lesson Planning:

PHIL TUCHER: Good morning, my name is Phil Tucher. I'm a math coach and I'm here in Barbara Shreve's Algebra Success class.

BARBARA SHREVE: Good morning, I'm Barbara Shreve. I'm a teacher here at San Lorenzo High School and I'm teaching an Algebra Success class this morning.

PHIL TUCHER: I'm so glad to be back in your room and in your class today. I'm looking forward to it.

BARBARA SHREVE: I'm looking forward to it too.

PHIL TUCHER: Tell me a little bit about what you have planned for today.

BARBARA SHREVE: Today students are (inaudible) a unit on quadratic equations in their Algebra B classes. So they've been working with factoring and being able to sketch parabolas using intercepts and finding the vertex of a parabola without making a long table of values. And so today we are trying to make sense of given all these different ways we could see directions related to quadratic equations, how do you look at that and know what your first steps should be or could be. And also how do you make sense of what the directions are telling you about what the answer looks like, so you know where you're headed and have a direction to a problem.

PHIL TUCHER: Fantastic! So they've got some comfort with what the parabola looks like, how they could plot all the points, and then they're finding some short cuts and using their factoring skills.

BARBARA SHREVE: And actually trying to figure out "Now that I've looked at a lot of different things discretely, when they're all mixed up how do I make sure I know what to do?"

PHIL TUCHER: Could you show me just a couple of examples of different kinds of these very different samples?

BARBARA SHREVE: Sure. So as they work today, they're going to be asked different things, like given an expression x^2-7x+10, how do you factor it? Given the same, apparently the same expression x^2-7x+10 but now it's y equals, so it's a full equation, now they need to find the x-intercept. So it looks very, very similar to students and they get confused about kind of where to go in the problem and where to stop. So we're looking at what cues they can take from the problem and start to build some confidence around "I know what my tools are and I know when I should be using them."

PHIL TUCHER: And you set it up as a matching exercise.

BARBARA SHREVE: We'll start with a class discussion looking at three different ways to start; where different students start, started in different ways, or ended up in different places, and talk about which ones of those make sense or not. And then they're going to go into some work in small groups, where they're going to look at matching, and they're given a lot of different first steps, and a lot of different sets of directions. And they need to try and figure out what goes together and why. In some cases there's more than one that's going to make sense, so that's a good starting place.

PHIL TUCHER: Groups of four, talk just a little bit about why you chose matching and how the matching helps them to be in conversation together about this work.

BARBARA SHREVE: This is a group that is having this class as some extra support while they're in algebra. So they're learning these and having a chance to really focus in on all of the steps in other places as well and we have in here. But at this point, being able to see a breadth of problems over a shorter period of time is helpful. And so creating that matching opportunity I think sets up, "I can look at eight different problems side by side with their answers, and work through that very quickly" rather than getting lost in some of the details that might trip these students up as they're trying to work through the intricacies of the problem.

PHIL TUCHER: That makes a lot of sense. Are there a particular...of those eight, are there particular ones that you think will be fun to see or extra challenging for the kids where you think they may get stuck?

BARBARA SHREVE: On a small level I think some of the vocabulary, like the vocabulary of roots is something that I'm not sure how many students will have seen and that may be introduced here. Some of the vocabulary...or some of the intricacies of the quadratic formula; different classes are in different places and it's not something they've taken on directly in this group, so I'm curious to see how that happens. But um, bigger picture, the sense of factor versus actually solve and get an x equals answer, or when I'm just simplifying to a point, and when I'm working through to get a concrete, like, point as an answer is going to be something that they've already raised some questions about, and I'm excited to put those side by side this morning and really have a look at that.

PHIL TUCHER: They've worked at it in their core algebra class and now they're coming to support class to Algebra Success, and with you they're having a chance, and with their peers they're having a chance to see which of the pieces they feel they've really got comfortable now. Good. You have about 28 students in the class.

BARBARA SHREVE: Yes.

PHIL TUCHER: Talk a little bit about where the class is, what you anticipate in your teaching in terms of where the kids are as a class.

BARBARA SHREVE: Where the kids are as a class is they, um, in their Algebra B classes they are engaged both in individual work and in group work on a regular basis, so working collaboratively with teams and talking. And that aspect of how students work together has been more challenging at times in here because obviously these students kind of hit the edge of their comfort zone. Their natural reaction is to get very much in their own heads and with their own work, and only want to interact with the teacher. So I'm hoping to push that a bit today because they've had some time to build confidence with these problems more discretely. But that's something that is always a back and forth in a sense of the room as the lesson is going on.

PHIL TUCHER: If I'm hearing you, some of them are really going to turn to you first and you're going to have to figure out "Yes, let me meet you with just what you want" or "Nope, I'm going to turn you back to the kids that you're working with."

BARBARA SHREVE: Yes. And trying to find ways to turn them back and have them keep going instead of shut down is the delicate balance we're always working on in here. So there's quite a bit of cajoling that happens.

PHIL TUCHER: I'm looking forward to cajoling. Any particular groups in here that...because you only see them every other day, are there any particular individuals or groups that are on your mind in terms of the lesson you've planned?

BARBARA SHREVE: Um, there are some groups and teams that are really interesting to me right now. There's a team that sits up in the front corner of the room that is primarily students who are second language learners. And they've been having some very active conversations, mostly in their native language, Spanish. And they've also...I'm hearing from their Algebra B teacher, been really doing well in there. So they're coming from different sections of Algebra B but are all together in this class, and I'm excited to see what that will look like today. There's also a group of individuals in the back of the room who have each in their own classes had a lot of questions lately, and with a new semester starting just two weeks ago, have really taken on a new learning agenda. And so I'm looking forward to seeing what that looks like.

PHIL TUCHER: I'm particularly interested in how kids are bringing in their different algebra experiences and skills to the table. And that's what I'll be looking for but are there other things that you'd like me to be thinking about while I'm in your classroom?

BARBARA SHREVE: Um, one of the things that I'm always wondering with this group is how they're taking the pieces that we work on and not just stopping where they're confident of an answer, but making sure that they've understood it well enough to think about how to apply it the next time. And so if you're seeing students generalizing "Oh, so I use a generic rectangle when..." and hearing those sorts of things, that's something I'm always listening for and an extra ear to see how that happens or does not happen would be incredibly useful.

PHIL TUCHER: That was supposed to be my last question but I wonder what are you doing in the lesson or what did you do on Wednesday to get them to a place where they're likely to make those general statements? Is there something in the activity itself, or is it something you're going to do when you set it up, or that's just the way you've been really encouraging them to work together?

BARBARA SHREVE: On Wednesday where they were actually working through a lot of problems like this but chunked in particular ways. And so...like for all of one kind of problems grouped together, and I was asking them to think about the same questions of "What is the first step? What does the answer look like? What tools do I have?" And so today with all those side by side, I'm hoping that they'll start to continue that conversation and thinking about what first steps look actually very similar even though our end results look very different.

PHIL TUCHER: Excellent! I'll have my eyes open. Look forward to talking to you afterwards.