Video Supplement

Norms for Watching Video (if not using your own)
● Speak from the "I" perspective. For example: "If I could rewind the tape and ask students a question, I would ask…"
● Be inquisitive, not judgmental. For example: "I wonder what might happen if," instead of "the teachers should have…"
● Justify your ideas and conjectures based on the video clip, and not other parts of the lesson that you didn't see. For example: "I think that the student understands...because in the video she…"
● Focus on how what you learned from the video might help you implement this (or similar lessons) with your own students.

School Context
● School Type: Urban Public School
● School Demographic Information (approximate):
    o Students of color: 80%
    o Free and reduced lunch: 75%
    o English language learners: 5%
    o Students with special needs: 20%

Lesson Context
● Subject: Algebra II
● Unit: Radicals
● Number of students in class: 32
● Lesson duration: 90 minutes
● Prior preparation: The teacher decided to use this lesson as an introduction to the unit on radical equations. The students have had prior opportunities to learn about radical expressions, exponents, and solving basic radical equations.

Video Context
Students have already done the opening problem and are now receiving the envelope with the card sort activity. The teacher gives the context for the card sort, and the video highlights two interesting moments that the same group has with different cards. For each of the statements, ideas of precision and cognitive demand are expressed on the whiteboard and aloud.

Discussion Questions
Cognitive Demand: *How long am I given to think, and to make sense of things? What happens when I get stuck? Am I invited to explain things, or just give answers?*

1. **What do students' explanations tell us about what they struggle with or find challenging?**

2. **As a teacher, what questions might we ask or moves might we make that help students struggle more productively by inviting them to make sense of and explain important mathematical ideas?**

Video Transcript

Legend		
T	Teacher	Per and within dialogue
S1 – S2	Students 1 - 2	Per and within dialogue
C	Class	Per and within dialogue
[ ]	Actions/Non-verbal	Dialogue
{{x}}	Sounds like	Dialogue
{{}}	Inaudible	Dialogue

1	T:	0:00	What I want to do next is, you can erase the boards. Uh, I think I might. Well, I'll put this on the
2			board for a couple of minutes. You're going to take one of these sheets per pair, and then one
3			of these envelopes; please read the directions on the board. Take one of the envelopes. So,
4			you're going to, you're going to take turns doing the following. You're going to group, you're
5			going to label each of the six cards that you have left, always, sometimes, or never. You're
6			going to, you're going to talk to the person next to you, right? You're going to explain whether
7			it's always... sometimes always or never. You're going to put it in the appropriate place. The
8			other person will confirm or question that and you will move appropriately. Got it? Now I'm
9			going to give you 15 minutes to do this, so.

Students are working on their problems. One group is using the opening to focus on Problem A.

10	S1:	1:35	Five plus Five plus x minus five plus negative x minus five, right, so then that would be zero.
11			But then that would be negative ten because we changed both of them, plus that would be
12			zero. So then (from example *to whiteboard problem*) that would just be negative x, and that
13			would be four because we keep that one, right? So then, this is two radical two x plus (S2:
14			two?) maybe four.
15	S2:		Oh, alright.
16	S1:	2:22	And then, we minus four minus four... zero equals two radical two x. And then we bring that
17			over two... zero equals radical two x. Now we have to square it. Square, square... zero equals
18			two x, so x equals zero. You think that's wrong?
19	S2:		It feels weird.
20	S1:	3:02	Ok we'll come back to it, yeah. But just in case we will write like a little note x equals zero for A.
			Alright, which one do you want to do?

Later on, the teacher is helping the same group as one student is explaining work for Problem C

21	S1:		So then, to get rid of the square, we square root it and then we just go back to the same thing.
22	T:		Are you sure that you are doing this correctly?
23	S1:		I don't know, that's why we called you over!
24	T:	3:27	Negative two x divided by negative two... so this is two minus x equals two, two plus x minus...okay. So, what are you...
25	S1:		Oh, would that be zero... no no no.
26	T:		So what's your question?
27			
28			
29	T:		Okay.
30	S1:		And then wouldn't you solve it-
31	T:		Wait, x... aren't you squaring a square root?
32	S1:		Yeah, so it would be two x.
33	T:		Okay.
34	S1:	4:18	And then it would, but then it would be x squared equals two x.
35	T:		Okay.
36	S1:	4:23	And then, where would you go from there?