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BEYOND "TELL ME WHAT YOU NOTICED": USING VIDEO TO IMPROVE INSTRUCTION

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WHERE DISCOVERIES BEGIN

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COMMON WAYS OF USING VIDEO IN PROFESSIONAL DEVELOPMENT

View and discuss (What did you notice?)

Exemplify "best practice" (the model)

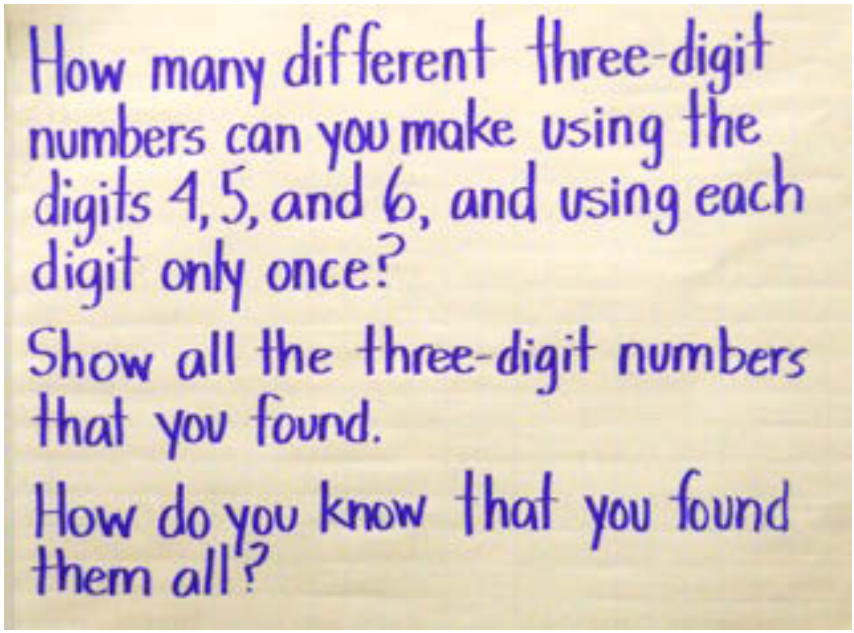
Analyze using some frame

All of this rooted in a belief in the basic value of "seeing" and discussing teaching

EDUCATION

CLASSROOM VIDEO CONTEXT

- 29 fifth graders; 15 girls, 14 boys; 77% African American, 13% White, 10% Latino/a
- Most have not experienced success in school mathematics or other areas
- Work on mathematical topics and practices named in the Common Core



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WHAT DO YOU NOTICE?

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WHAT MIGHT BE THERE TO NOTICE*?

TYPICALLY COMMENTED ON

- The teacher uses "wait time" before calling on students
- Brionne has trouble expressing herself
- Interesting idea to ask about the wrong number
- Teacher is facilitating, she does not give them the conditions
- The students do not all seem engaged
- Might have been better to do a turn and talk or partner work

RARELY COMMENTED ON

- Teacher's wording of the question about the condition ("What does his number do that he gave us? The wrong number. What does it do that doesn't follow the rule?") is awkward
- What the reason for identifying "conditions" might be; unpacking details of the strategy for asking for a wrong answer
- The teacher's decisions about recording on the board: what, how, when

*Willis, A. (in progress). What do teachers notice while observing the Elementary Mathematics Laboratory?

EDUCATION

VIDEO AS A RESOURCE, CA. 1990 → PRESENT

- Rapid advances in the technology for capturing classroom instruction
- Video records of teaching widely available
  - Records of teachers' own teaching
  - Records of other teachers' teaching
  - Commercially produced videos with commentary and collections (e.g., Annenberg, Teaching Channel, MET-x,) and libraries (e.g., the Teaching and Learning Exploratory at the University of Michigan)
- Acccess to instructional practice as text for developing knowledge and skill

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THE TECHNOLOGY HAS ADVANCED MORE RAPIDLY THAN THE PROFESSION

- Video is like a "manipulative" (e.g., like base ten blocks): it is not magic (Prediger: "not self-contained")
- Underdeveloped instructional practice for using video
- Confounding of video types (e.g., teachers' own videos and videos from public collections)
- No professional system for searching collections, no common standard for quality, indexing

NEED FOR MORE DETAILED DEVELOPMENT OF PRACTICES FOR INSTRUCTIONAL USES OF VIDEO

1. Learning goals for teachers/teacher candidates
2. How the use of video can be used for that learning goal
3. Specific practices

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THREE LEARNING GOALS

1. Develop and practice mathematical knowledge for teaching (MKT; Ball & Bass, 2001; Hill, Rowan, & Ball, 2005; Ball, Thames, & Phelps, 2008)
2. Identify and unpack techniques and approaches to solve particular recurrent pedagogical problems
3. Learn to hear and interpret (common or unexpected) student thinking in a specific mathematical content domain

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EXAMPLES OF LEARNING GOALS FOR SPECIFIC HIGH-LEVERAGE PRACTICES

- Practicing explaining or modeling core content
- Appraising and modifying tasks
- Designing methods for assessing students' thinking
- Developing skills for analyzing, learning from, and improving one's own practice
- Developing mathematical knowledge for teaching (MKT) (subject matter knowledge as well as pedagogical content knowledge) (Ball, Thames, and Phelps, 2008)

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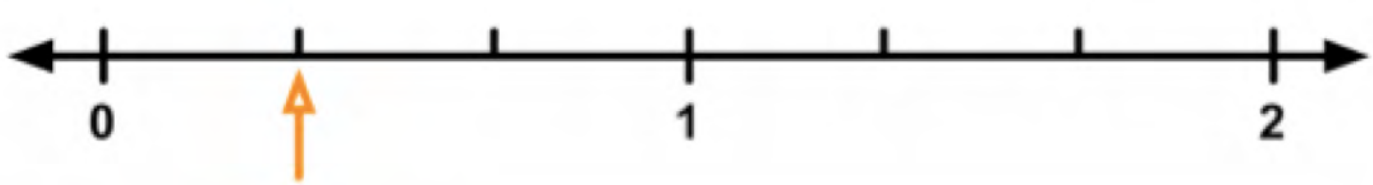
TASK

What number does the orange arrow point to? _____



Explain how you know: _____

_____

_____

_____

_____

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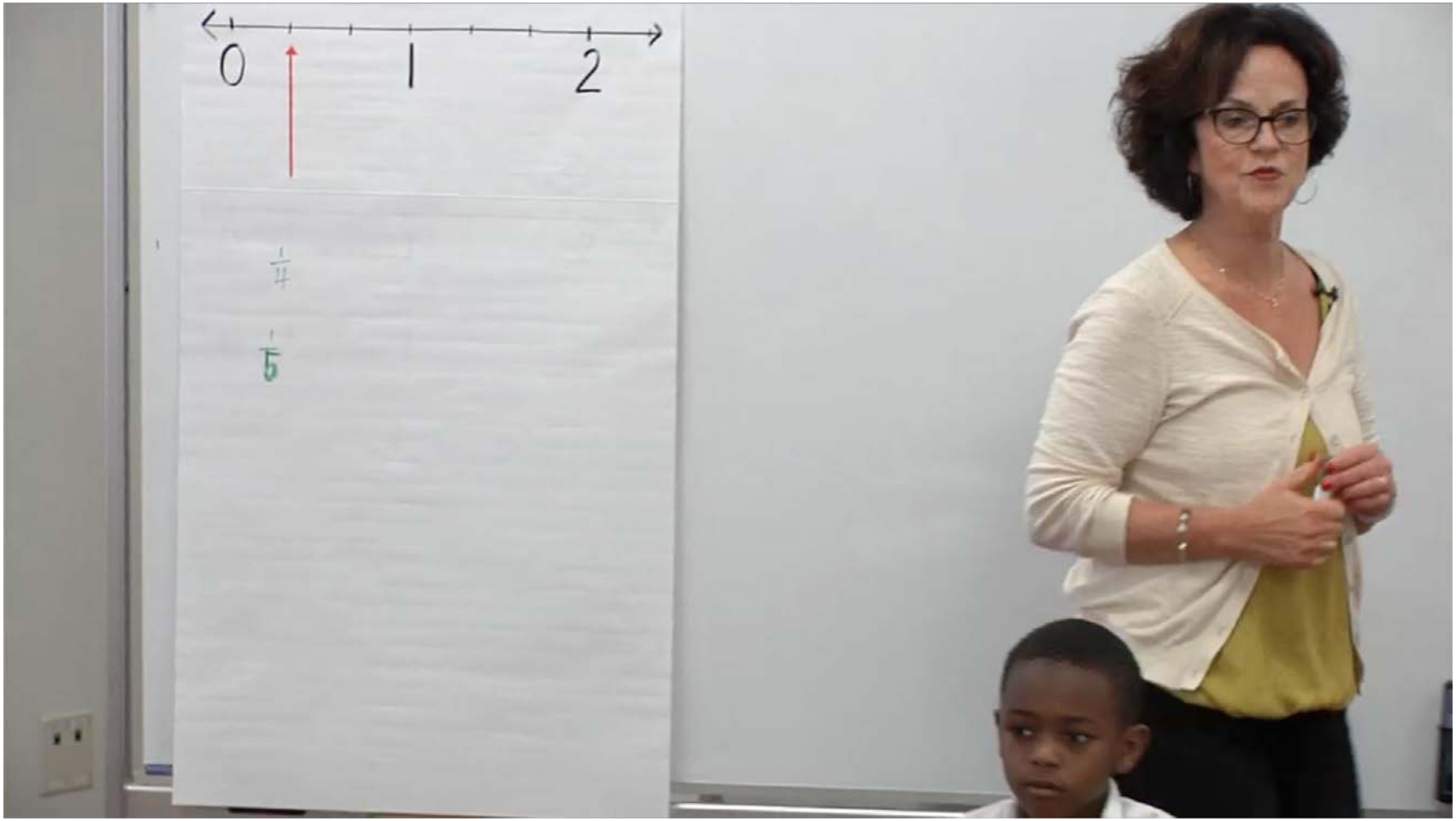
VIDEO



EDUCATION

1. STRUCTURING OPPORTUNITIES TO LEARN CKT

1. Using the Common Core definition of a fraction, try to write a version that would be usable by fifth graders.
2. Choose three fractions to ask students to locate on the number line to develop their ability to use the CCSS definition.

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GRADE 3: NUMBER AND OPERATIONS – FRACTIONS

Develop understanding of fractions as numbers.

CCSS.MATH.CONTENT.3.NF.A.1

Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b*.

CCSS.MATH.CONTENT.3.NF.A.2

Understand a fraction as a number on the number line; represent fractions on a number line diagram.

CCSS.MATH.CONTENT.3.NF.A.2.A

Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.

CCSS.MATH.CONTENT.3.NF.A.2.B

Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.

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2. CONSIDERING AND SOLVING PEDAGOGICAL PROBLEMS

1. Managing equity and relational issues: Toni asked Aniyah, "Why did you pick one-seventh?"
   a) How might you position the two girls with one another and the class?
   b) Are there important issues to attend to here with respect to equity?
   c) Are there other things you might do to reinforce or support their work in public?
2. Formulate an exit ticket question based on this, to check what the students learned from following this interaction.

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3. LEARNING TO HEAR AND INTERPRET STUDENT THINKING

1. What does Aniyah's explanation show about what she understands? (about fractions, about mathematical explanation)
2. What were the key questions asked by the teacher? What did they accomplish? What might have been a point where a specific move or question could have been made? Be specific and explain the purpose.
3. What might students have been learning? What is your evidence and how could you probe this further?

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USING VIDEO AS "TEXT": DIFFERENT TASK TYPES CAN BE DESIGNED FOR THE SAME VIDEO

	Exercises in MKT and MKT reasoning	Solving pedagogical problems	Listening to students' thinking
Video clip: Aniyah's explanation at the board	Write a usable definition of fractions based on the Common Core definition. Choosing other fractions to use as examples, and justify the choices mathematically and pedagogically.	Managing equity and relational issues Formulating exit ticket questions	What does Aniyah's explanation show about what she understands? What were key questions and moved made by the teacher to unpack Aniyah's thinking? What might other students be learning and how could you find out efficiently?

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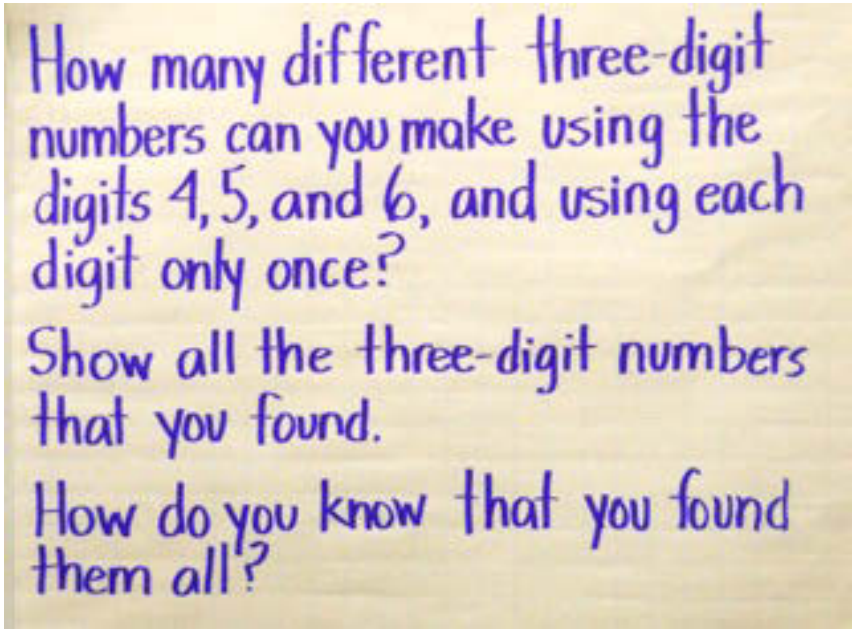
RE-CONSIDERING THE "4, 5, 6 PROBLEM"



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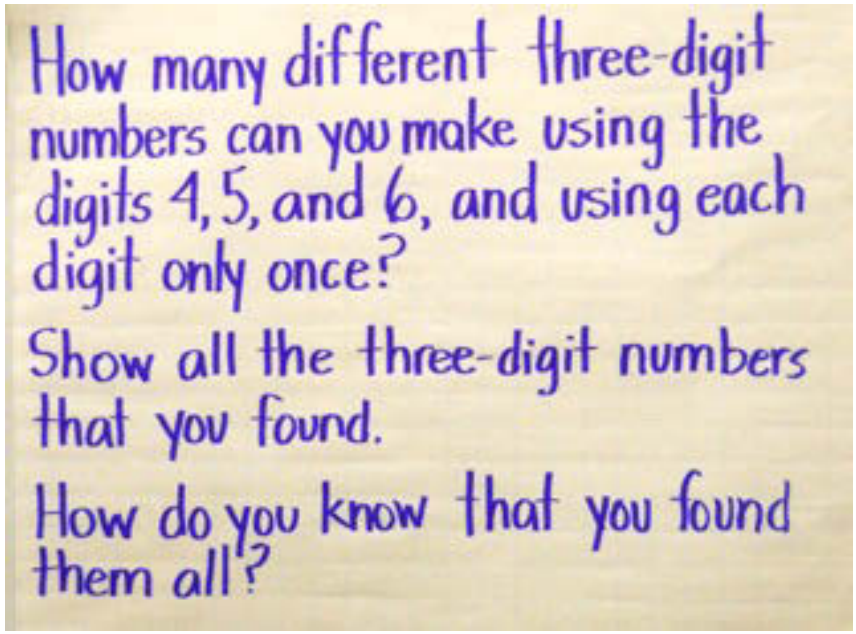
STRUCTURING OPPORTUNITIES TO LEARN CKT



555 is a wrong number.

Conditions of the problem:

1. Use each digit only once

- Identify the other "conditions" (or rules) of the problem.
- For each condition, identify one non-solution that could be shared to elicit the condition from students.

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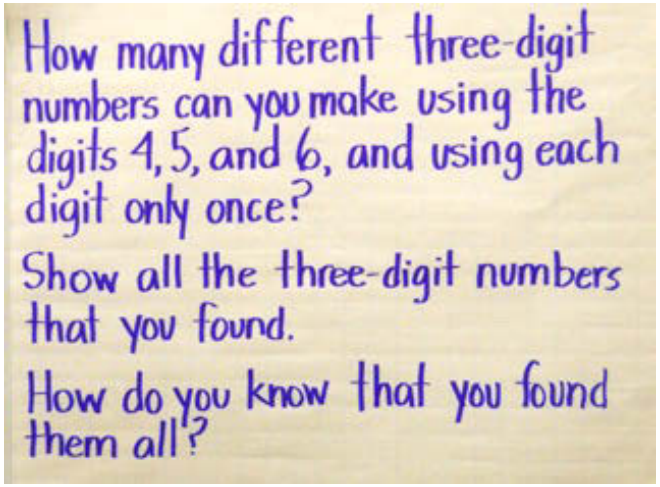
STRUCTURING OPPORTUNITIES TO LEARN CKT



555 is a wrong number.

Conditions of the problem:

1. Use each digit only once
2. Use 4, 5, and 6
3. Use each digit only once.

- How many three-digit numbers can be made?
- What would happen to the number of solutions to the problem if "use each digit only once" was removed from the problem conditions?
- Can you create another problem with the same mathematical structure that requires similar mathematical work?

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SOLVING PEDAGOGICAL PROBLEMS

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SOLVING PEDAGOGICAL PROBLEMS

1. Formulate a question to ask each student to write in his/her notebook that would engage them and allow you to learn what they are each thinking about this condition. ***(HLP: designing ways to assess student understanding)***
2. Incorrect answers are being shared to make the "conditions" of the problem explicit. How might the board space be organized in used to support the development of a record for the class to reference and use?

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LEARNING TO HEAR AND INTERPRET STUDENT THINKING

Design a task that could be used to practice learning to hear and interpret student thinking.

NEXT STEPS

1. Need to develop more explicit possible learning goals for learning to teach
2. Seek to expand ways in which video can be a context for learning to enact specific high-leverage practices, not just analyze them
3. Need to specify instructional designs to use video as a resource for particular learning goals

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