Monitoring YOUR Classroom Canvas with The Formative 5 – You Can Do This!

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Student Resources

1. Observations
2. Interviews
3. Show Me
4. Hinge Questions
5. Exit Tasks

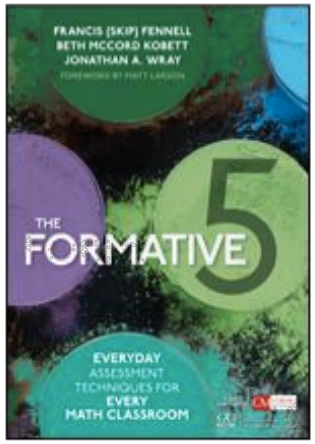
Book Study Guide (Word)

Book Study Guide (PDF)

Welcome to the Companion Website

"This book is a gem. Fennell, Kobett, and Wray don't just provide advice on what to do; they provide you the tools you need to implement specific formative assessment techniques in *your* classroom."

—From the Foreword by **Matt Larson, PhD**
President, National Council of Teachers of Mathematics



Authors: Francis (Skip)

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Who are you?

- Where are you from?
- What do you do?
  - Mathematics Specialist / Instructional Leader?
  - Teachers?
    - Level?
      - PreK-2, 3-5, 6-8
    - Other? (e.g. special education, ESOL, etc.)
  - Administrators?
    - Principal or Assistant Principal?
    - Supervisor/Curriculum Director?
  - Other?

Assessment Literacy

- What is it?
- Why is it important?

- Assessment of student learning is the responsibility of every school district, every school, and every teacher.
- Reality – you do this everyday, pretty much all day long!

- Formative assessment includes all activities that provide information to be used as feedback to modify and impact planning, teaching and learning.

- Summative assessments are typically used to assess student learning at the end of an experience. This could be a unit assessment, school district assessment, or the more high-stakes and high-profile end-of-year state assessments.

What about you?

- Reflect back: did you learn this?
- What about now? How confident are you with regard to assessment – all aspects?
- Personal “confession”

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What about you?

- Think about discuss/share – how does your school or school district define Formative Assessment?

- Think about discuss/share – How do **YOU** use formative assessment?

We actually know a lot about formative assessment…

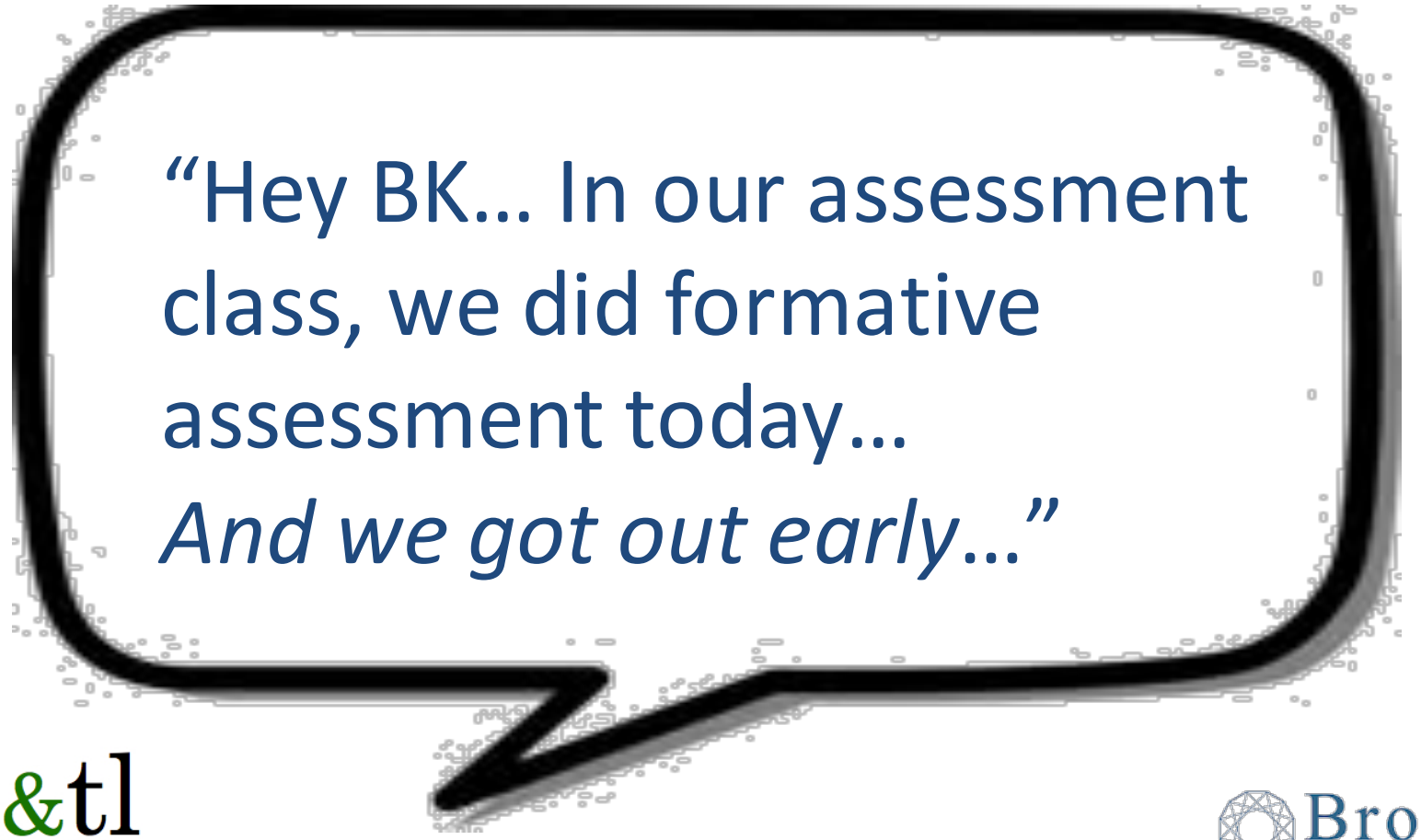
- The term formative assessment has been with us for 60+ years (e.g., Sueltz et al, 1946; Weaver, 1955)….

- Regular use of classroom formative assessment would raise student achievement by 0.4 to 0.7 of a standard deviation – enough to raise the U.S. into the top five countries in the international rankings for mathematics (Natriello, 1987; Crooks, 1998; Black and Wiliam, 1998).

And there's much more we could add here…

But…

Evidence suggests that actual day-to-day use of formative assessment is *not as prevalent in classrooms as one might expect* (Stiggins, 2013).



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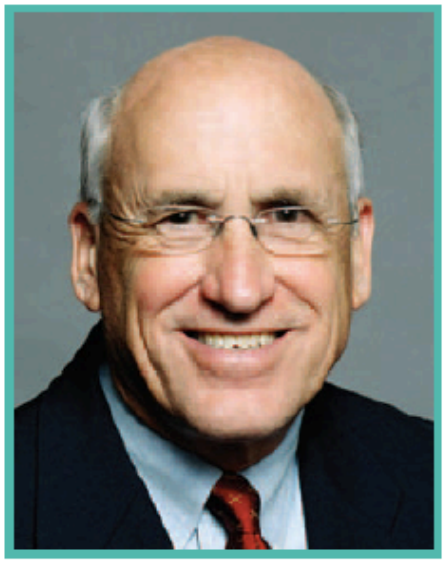
This has been festering…

President's Message

Go Ahead, Teach to the Test!

Francis (Skip) Fennell



Since NCTM released *Curriculum Focal Points*, I have learned that columnists can say whatever they want in a headline to lure readers into their article. You have to admit, my headline grabbed you, didn't it? Well, now that I have your attention, I'll get serious. Let's talk about assessment—formative assessment, to be exact.

NCTM's Assessment Principle indicates that assessment should not be done *to* students; rather, assessments are *for* students and should be used to guide and enhance their learning. There are several forms of assessment. *Formative assessment* involves using classroom-based assessments to collect feedback that can be used to improve teaching and learning. *Summative assessment* measures what students have learned at the end of a

The student interview is another formative assessment technique that teachers can use; it is particularly valuable for assessing the progress of individual students. The interview protocol might engage a student in solving a few problems or exercises. The accompanying questions might require the interviewee to describe the steps that he or she used to complete the example problems. The assessment would then determine the student's level of understanding and would examine the student's thinking. The interview is especially useful for the early identification of misconceptions.

NCTM News Bulletin, December 2006

The classroom is your canvas…

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Assessment Literacy

I just figured I could Google formative assessment and buy whatever formative assessment I wanted/needed.

Middle School Teacher

Tried it and Formative Assessment got "about" 3,430,000 hits!!

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What we have done…

- First, we recognized:
  - A need to emphasize and enhance the use of classroom-based formative assessments – to guide teaching and learning.
  - An overload of publications, published assessments and services promising the quick formative assessment fix.
  - A focus on "surface-level" formative assessment "tricks"
- So, we:
  - Distilled seemingly endless suggestions and strategies to a small pallet of formative assessment techniques.

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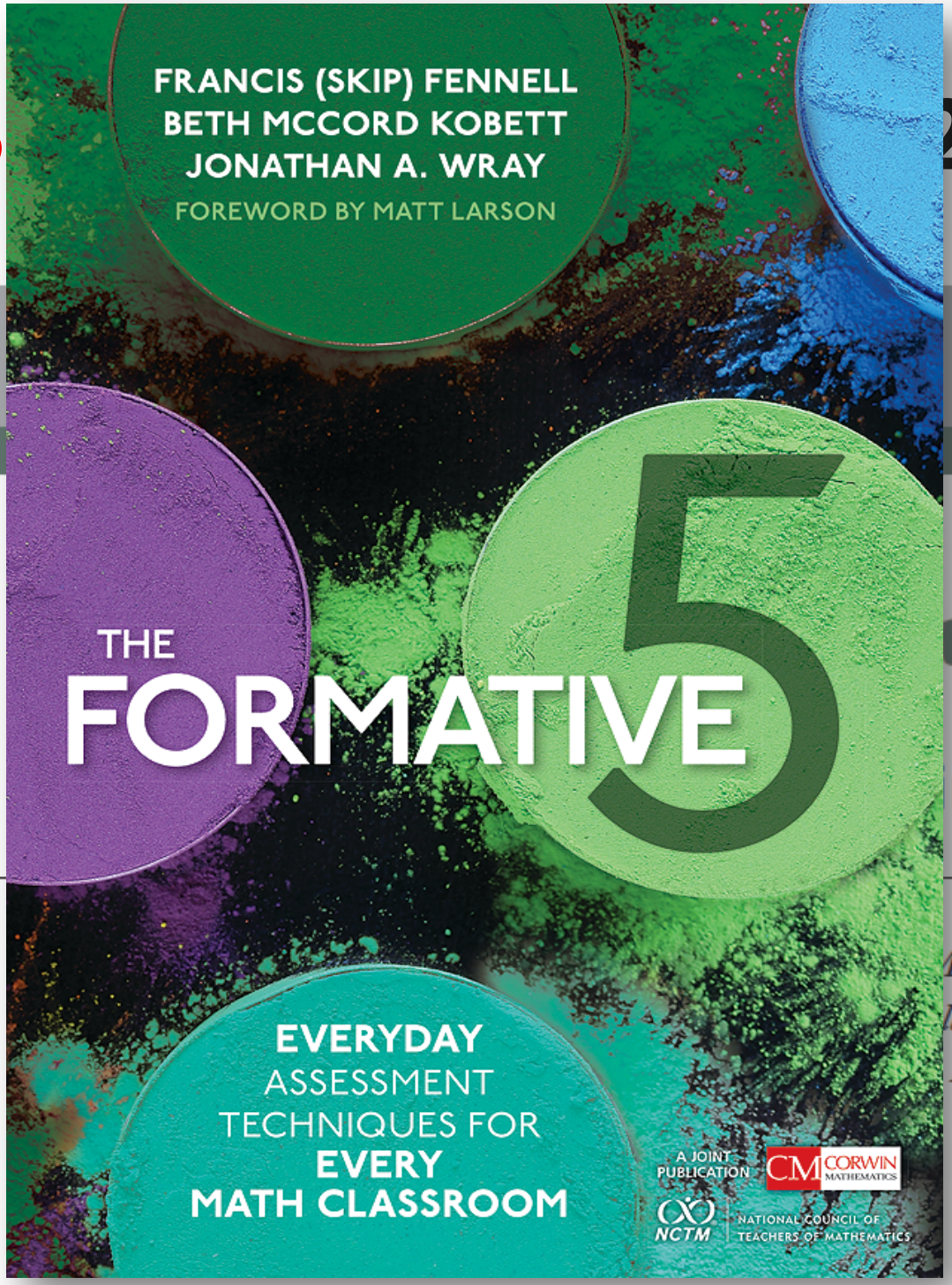

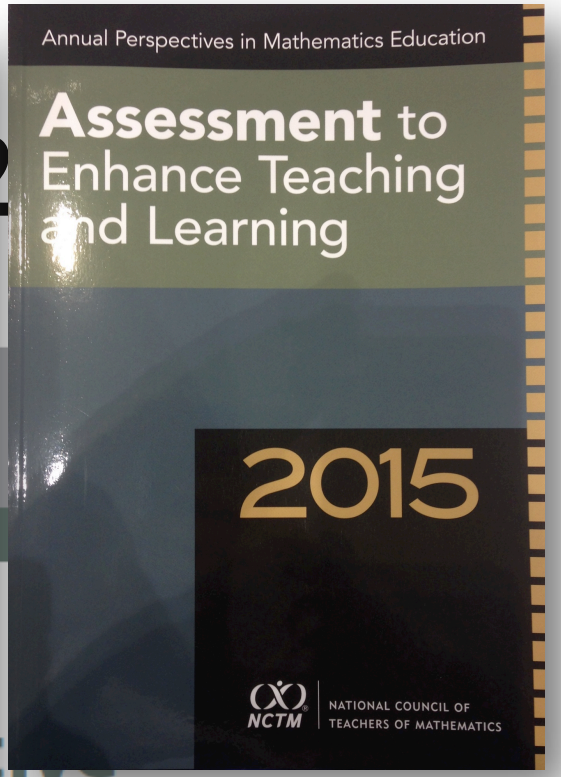

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"The Formative 5"

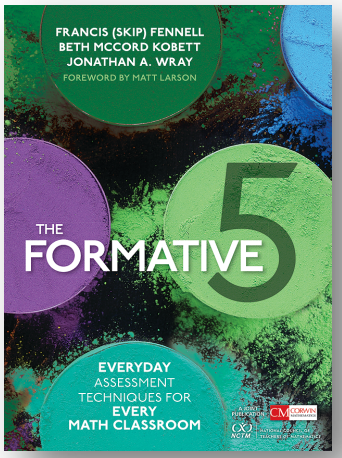
Interviews

Show Me

Hinge Questions

Exit Tasks

Observations



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Observations

How is observation assessment? Of course I observe my students—all day long every day! I just never considered the assessment potential of my observations!

First Grade Teacher

I actually know more about my students because I am always watching them work and also seeing how they interact—with the mathematics they are learning and with each other. For me, observation is my everyday formative assessment lifeline!

Fourth Grade Teacher

Observations

- What would you expect to observe (anticipation)?
- How would you *know it* if you saw it?
- What misconceptions might you observe?
- How might you record and provide feedback of what you observed?

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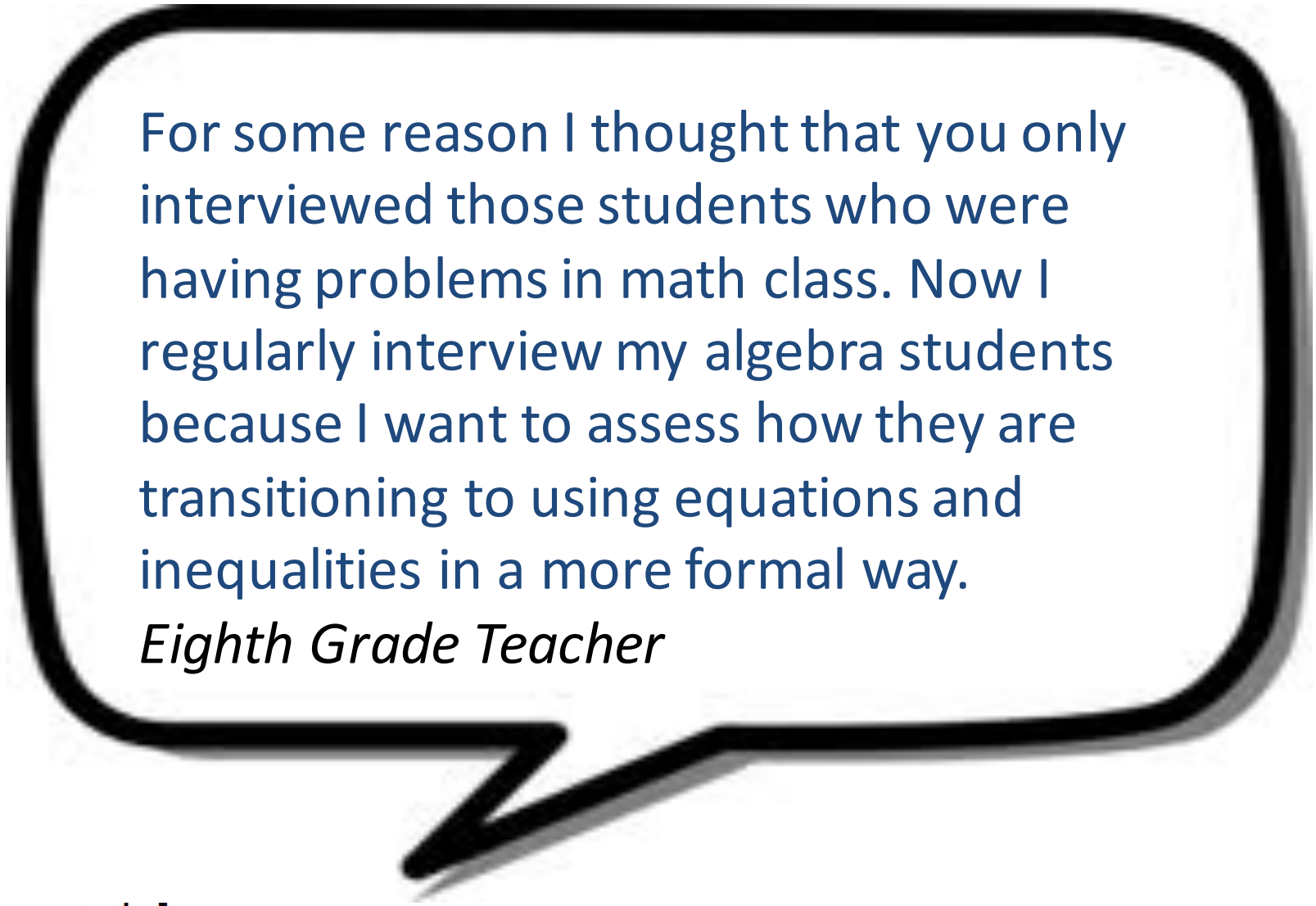
Classroom: Observation—Student Representations

Student Representations (Anticipated/Observed)	Who Is Using Specific Representations	Who I Will Select to Share Their Representations (order of presentations; 1st, 2nd, . . .)
Anticipated:		
Observed:		
Observed:		
Observed:		
Observed:		

Source: Adapted from Smith, M. S., & Stein, M. K. (2011). *5 practices for orchestrating productive mathematics discussions*. Reston, VA: National Council of Teachers of Mathematics.

Interviews



For some reason I thought that you only interviewed those students who were having problems in math class. Now I regularly interview my algebra students because I want to assess how they are transitioning to using equations and inequalities in a more formal way.

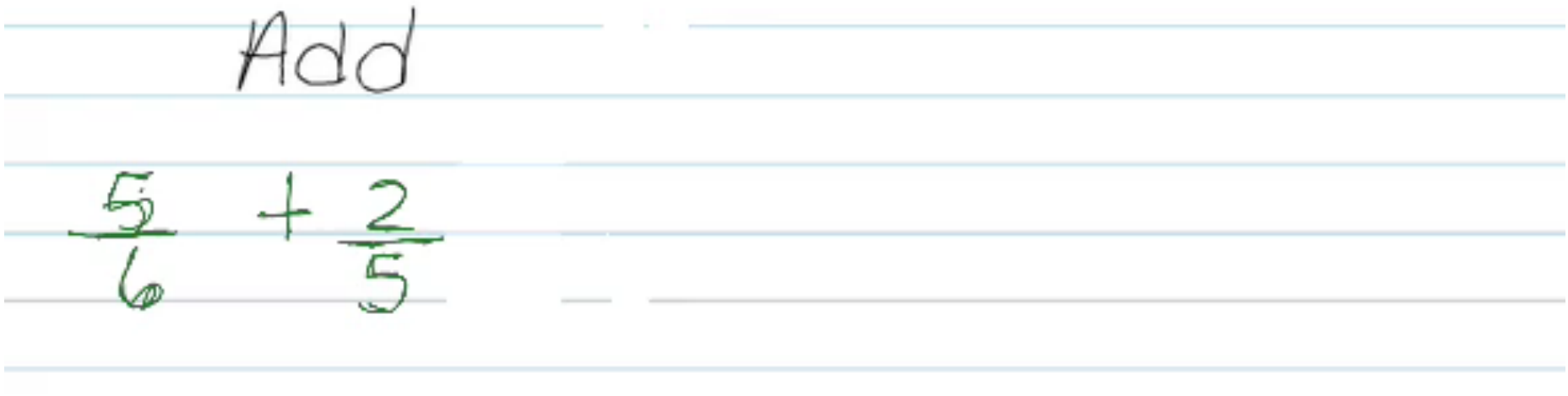
Eighth Grade Teacher

Interviews

- Long history of use in mathematics and special education (Weaver, 1955; Ginsburg, 1997; Fennell, 1972, 1998) .
- **Extends the observation.**
- Takes some time – focused; 1-on-1 or small group
- Allows you to dig deeper
- **Not deficit-based**
- Provides a glimpse of what a child is thinking

Interviews

- What would make you decide to work 1:1 with a student or small group?
- What questions might you ask? How might the questions be different?
- What will you anticipate from students? (Consider understandings AND possible misconceptions.)
- What follow-up questions might you ask?



Okay… now what?

Framework of an Interview

- *Problem, task, exercise (ask student to talk through the following)*

- How did you solve that?
- Why did you solve it that way?
- What else can you tell me about what you did?

Individual: Student Interview Prompt

Interview Prompt*		
Name:	Date:	Math Topic:

Question	Student Responses
1. How did you solve that?	
2. Why did you solve the problem that way?	
3. What else can you tell me about what you did?	

*Note: Attach completed work sample(s).

Show Me

- A performance-based response to what a teacher observes.
- Combines elements of the observation and interview.
- A *stop-and-drop* activity where a student, small group of students or perhaps the entire class might be asked to show how something works, a problem solved, or a particular representation used.

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Show Me

"Can you show me how you would order 76, 54, 47, and 89 using the number line?"

"How do you know 3/4 < 7/8? Show me."

"Show me your graph for that equation."

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Show Us!

- Show me: A representation of how you would compare the following:
  - 3/4
  - 0.65
  - 0.09
  - 5/10
  - 34%
- Use materials provided

Now what???

Technology Tools

goformative.com

Quick code: FRAX273

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Show Me - What about You?

- Are there particular lessons that you think would provide opportunity for more *Show Me's* than other lessons? Which? Why do you think so?

- Think through a lesson topic (ANY level). Think about planning this lesson – what might you observe? What would you have your students show you?

- ”I seriously think that one of the last things I got “good” at as a teacher was questioning.”

  - 6th & 7th grade teacher

- “It took me a while to realize that sometimes I needed to change – while I was actually teaching – the questions that I had planned to ask.”

  - 4th grade teacher

- “The better I feel about my planning, the easier it is to frame questions and then consider responses to help me plan for the next day.”

  - 2nd grade teacher

Questioning & Classroom Discourse

Posing effective questions is just one aspect of a larger construct – classroom discourse. Classroom discourse involves various teaching actions, including:

- Asking challenging questions
- Listening to student responses to gauge their learning
- Encouraging students to listen and respond to their peers
- Requiring students to explain their thinking
- Encouraging students to use multiple representations
- Allowing students to engage in productive struggle

(NCTM, 2006; Smith and Stein, 2011)

The hinge question provides a check for understanding or proficiency at a particular hinge point in a lesson. The success of the lesson hinges on responses to such questions as an indication of whether students understand enough to move on (Fennell, Kobett, & Wray, p. 84).

Think of your teachers and their use of questioning…

What comes to mind?
Can you picture a colleague who is adept at questioning?
Can you think of a colleague who struggles with questioning?

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Our take…

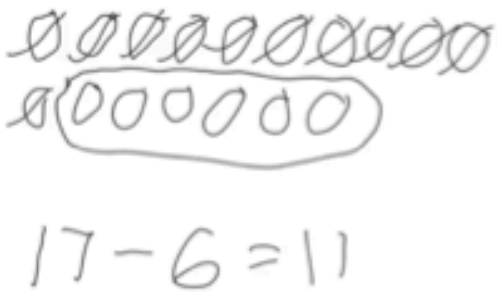
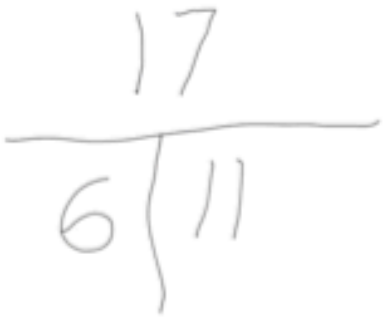
Students need to talk about the mathematics they are learning…questioning engages and supports that process

No questions asked…how can this be?

The Hinge – Focus and Issues

- Hinge Point or Hinge?
- Diagnostic focus – expands the interview…
- Multiple choice or not?
  - Student response cards
- 2 minute rule…

Bryce has 17 stamps from the United States and Canada how many are from the United States?

Kimberle	Jackson
	
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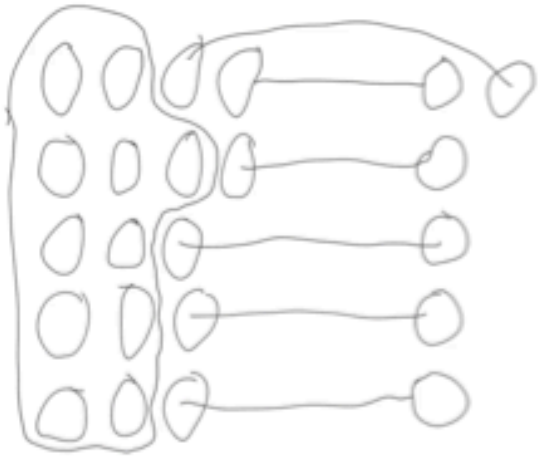	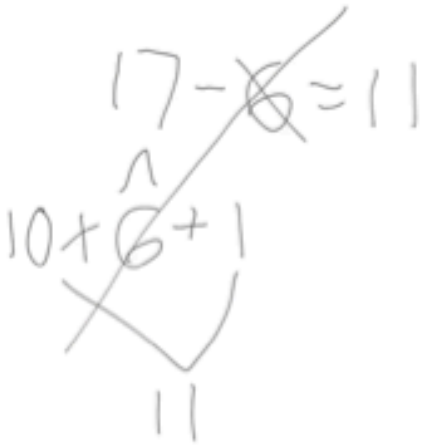

How Might Hinge Questions Inform planning and related instructional decisions and change a teacher's perspective about WHO needs additional support?

DO the same students always need additional support?

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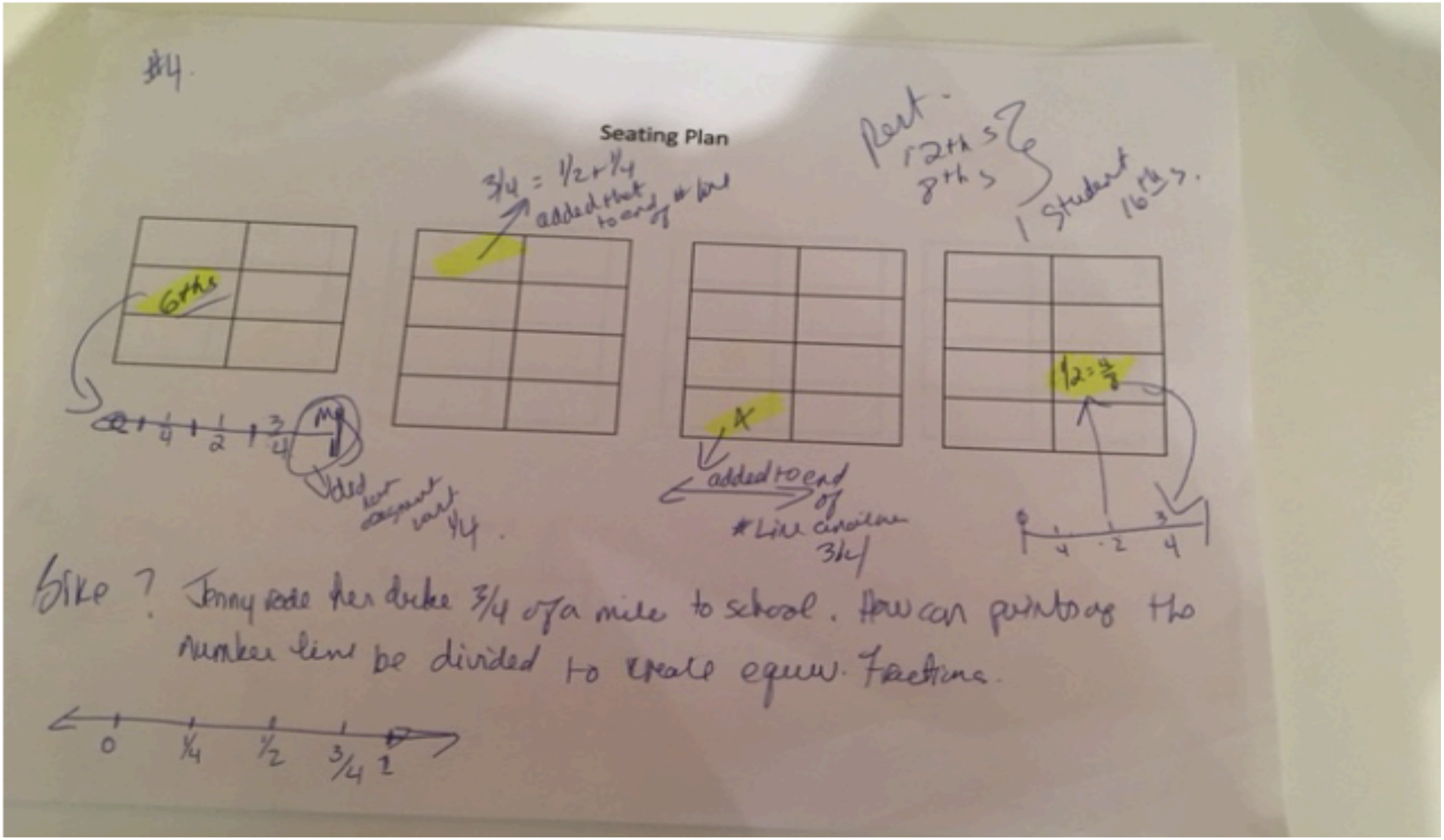
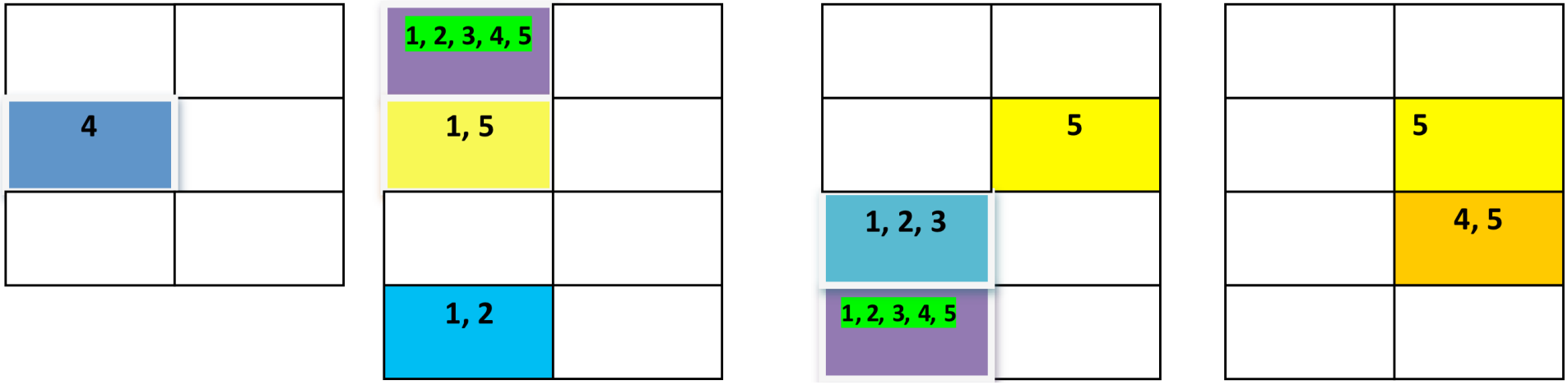
An example…


#4.
Seating Plan
3/4 = 1/2 + 1/4
6ths
added to end of
Bike ? Jenny rode her bike 3/4 of a mile to school. How can points on the number line be divided to create equiv. fractions.
0
1/4
1/2
3/4
1

Evaluation of One Week's Hinge Questions

(Observation Tool: Student Seating Chart)



Total number of students who required reteaching: **9**

Question #	**1**	**2**	**3**	**4**	**5**
# of Students Reteaching	5	4	2	4	6

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Which of the fractions below is less than $\frac{3}{4}$?
How do you know?

A $\frac{5}{8}$

B $\frac{1}{2}$

C $\frac{4}{4}$

D $\frac{3}{5}$

Hinge Question Responses	Student Responses
Students who correctly identified: $\frac{1}{2}, \frac{5}{8}, \frac{3}{5} < \frac{3}{4}$ Without using fraction bars	n = 20 students
Students who correctly identified: $\frac{1}{2}, \frac{5}{8}, \frac{3}{5} < \frac{3}{4}$ Used fraction bars to identify	n = 6 students
Students who identified only: $\frac{1}{2} < \frac{3}{4}$	n = 3 students

Planning: Hinge Question Considerations Tool

Date:		
Hinge Question:		
	Yes	No
Will the hinge question assess important mathematical understandings of the day?		
Will students understand the question?		
Will students be able to respond in about a minute?		
Will expected responses be such that they can be analyzed and interpreted quickly?		

General Consideration: Will responses assist in shaping planning for tomorrow's lesson?

Circle one: Yes No (If no, revise hinge question)

How?

Technology Tools

- Google Forms - https://www.google.com/forms/about/
- Kahoot - https://getkahoot.com
- Padlet - https://padlet.com/my/dashboard
- Plickers - https://www.plickers.com
- Today's Meet - https://todaysmeet.com
- Formative - https://goformative.com

Other

- Every Pupil Response (EPR)

What about You?
Hinge Question Considerations

1. How will you use hinge questions as you teach?

2. If you think of the hinge question as a whole class interview, how will you use the responses?

3. How will you consider student responses to a hinge question?

4. When you prepare to ask a hinge question, what might you anticipate?

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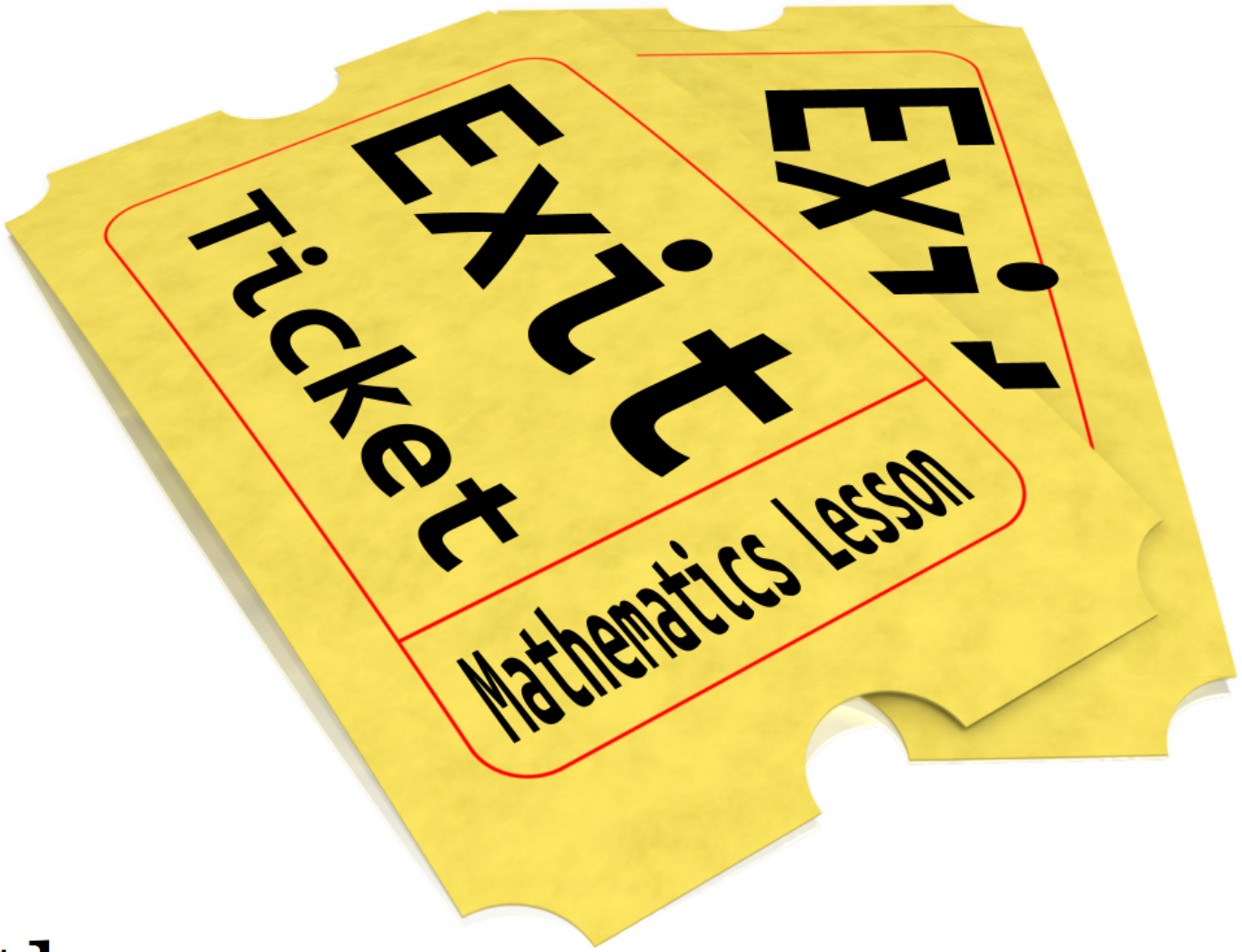
An Exit Task

Is a capstone problem or task that captures the major focus of the lesson for that day or perhaps the past several days (Fennell, Kobett, & Wray, 2017).

Different than an Exit Ticket…



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Original Task

Alane has the following number cards: 4, 9, and 12.

- Make a set for each number.
- Which set has the most? Least?

Revised Task

Alane has the following number cards: 4, 9, and 12.

- Show each number with cubes or a drawing.
- With cubes or a drawing, make a new group that is between 9 and 12.
- If Alane added 2 to each group, what are the new numbers?
- Would adding 2 to each number change the order on the number line?

Use the digits 1-9 to create 3 equivalent ratios. Note: each digit can only be used once.

___:___ = ___ ___ : ___ = ___ ___ : ___ ___

http://www.openmiddle.com/finding-equivalent-ratios/ Graham Fletcher, 2015

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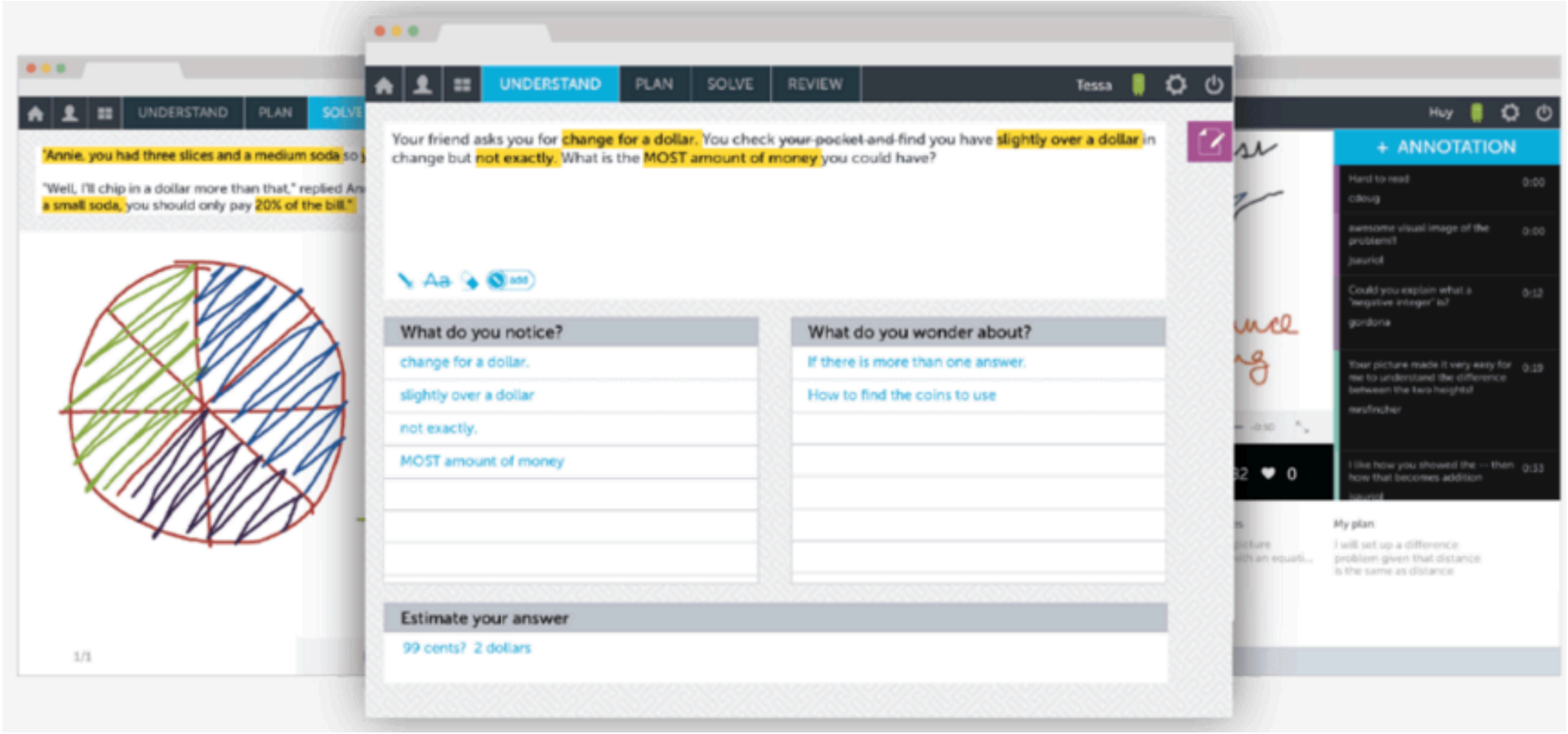
Technology Tools

CueThink – http://cuethink.com



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What about You? Exit Tasks

- Final activity – whole class Show Me Activity

- Time for all students to complete the activity should be provided (and for you to review responses)

"The Formative 5"

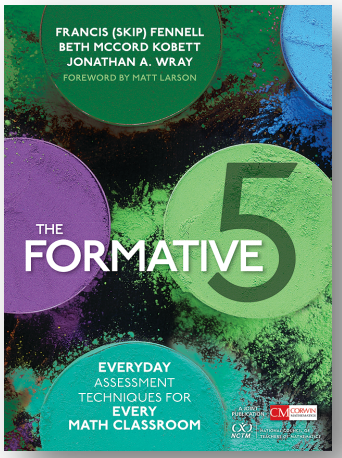
Interviews

Show Me

Hinge Questions

Exit Tasks

Observations



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What we know…*

- Everyday use of the *Formative 5* works!
- Teachers need time to think about and seriously connect planning, teaching, and assessing.
- Support is more than helpful, it's necessary!

*2-3 years of piloting and data collection

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How can we make sure that:

- Teachers plan lessons (very seriously stated);
- Classroom based formative assessment is part of that plan;
- Hinge questions and exit tasks are prepared as part of the lesson;
- Responses to the Formative 5 impact the next day's planning and instruction?

Formative assessment is:

- Students and teachers,
- Using evidence of learning,
- To adapt teaching and learning,
- To meet immediate learning needs,
- Minute-to-minute and day-by-day.

Love this…

Thompson and William, 2007

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Thank you!

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For slides (go to project resources):

http://mathspecialists.org