MSRI
Mathematical Sciences Research Institute

17 Gauss Way Berkeley, CA 94720-5070 p: 510.642.0143 f: 510.642.8609 www.msri.org

NOTETAKER CHECKLIST FORM

(Complete one for each talk.)

Name: Neelesh Tiruviluamala **Email/Phone:** tiruvilu@usc.edu

Speaker's Name: Alan Schoenfeld

Talk Title: The Practice and Use of Observation in Powerful Professional Development

Date: 2 / 11 / 16 **Time:** 5 : 15 am , pm (circle one)

List 6-12 key words for the talk: TRU (Teaching for Robust Understanding), Formative Assessment, Planning and Reflection, Classroom Observation

Please summarize the lecture in 5 or fewer sentences:
The speaker introduced the TRU (Teaching for Robust Understanding) paradigm. The five dimensions of a powerful mathematics classroom were explored: (i) The Mathematics (ii) Cognitive Demand (iii) Access to Mathematical Content (iv) Agency, Authority, and Identity (v) Formative Assessment. Specific examples of teaching tools were presented.

CHECK LIST

(This is **NOT** optional, we will **not pay** for **incomplete** forms)

- Introduce yourself to the speaker prior to the talk. Tell them that you will be the note taker, and that you will need to make copies of their notes and materials, if any.
- Obtain ALL presentation materials from speaker. This can be done before the talk is to begin or after the talk; please make arrangements with the speaker as to when you can do this. You may scan and send materials as a .pdf to yourself using the scanner on the 3rd floor.
  - **Computer Presentations**: Obtain a copy of their presentation
  - **Overhead**: Obtain a copy or use the originals and scan them
  - **Blackboard**: Take blackboard notes in black or blue **PEN**. We will **NOT** accept notes in pencil or in colored ink other than black or blue.
  - **Handouts**: Obtain copies of and scan all handouts
- For each talk, all materials must be saved in a single .pdf and named according to the naming convention on the "Materials Received" check list. To do this, compile all materials for a specific talk into one stack with this completed sheet on top and insert face up into the tray on the top of the scanner. Proceed to scan and email the file to yourself. Do this for the materials from each talk.
- When you have emailed all files to yourself, please save and re-name each file according to the naming convention listed below the talk title on the "Materials Received" check list. (*YYYY.MM.DD.TIME.SpeakerLastName*)
- Email the re-named files to notes@msri.org with the workshop name and your name in the subject line.

MSRI CIME 2016:
The practice and use of observation in powerful

An introduction to… **T**eaching for **R**obust **U**nderstanding

(TRU)

Alan Schoenfeld, U. C. Berkeley

What do good teaching and pornography have in common?

Justice Potter Stewart and a lot of other people...

"There is no empirical method without speculative concepts and systems; and there is no speculative thinking whose concepts do not reveal, on closer investigation, the empirical material from which they stem."

Albert Einstein

That is, we need explicit theories behind our empirical frameworks and they need to be empirically tested.

Today's Agenda

1. What really matters in classrooms? (Understanding what TRU is all about)
2. Some Tools for supporting powerful classroom instruction:
   - Formative Assessment lessons
   - Planning and Reflection
   - Classroom Observation Rubric
3. Q&A, on anything you want to talk about

Part 1:

What matters in classrooms?

If you had 5 things to focus on in order to improve mathematics teaching (or teaching in general), what would they be?

And,
How would you know
they're the right things?

Why 5 (or fewer)?

It’s as many as most folks can keep in mind. (In fact, it may be too many to work on at one time.)

If you have 20, you might as well have none. People can’t keep that many things in their heads, and long check lists don’t help. What matters is what people can act on, in teaching and coaching.

What properties should those 5 things have?

They’re all you need (there’s nothing essential missing).

They each have a certain “integrity” and can be worked on in meaningful ways.

Their framing supports professional growth.

You’re about to meet the
Teaching for Robust Understanding
of Mathematics
(TRU Math)
framework

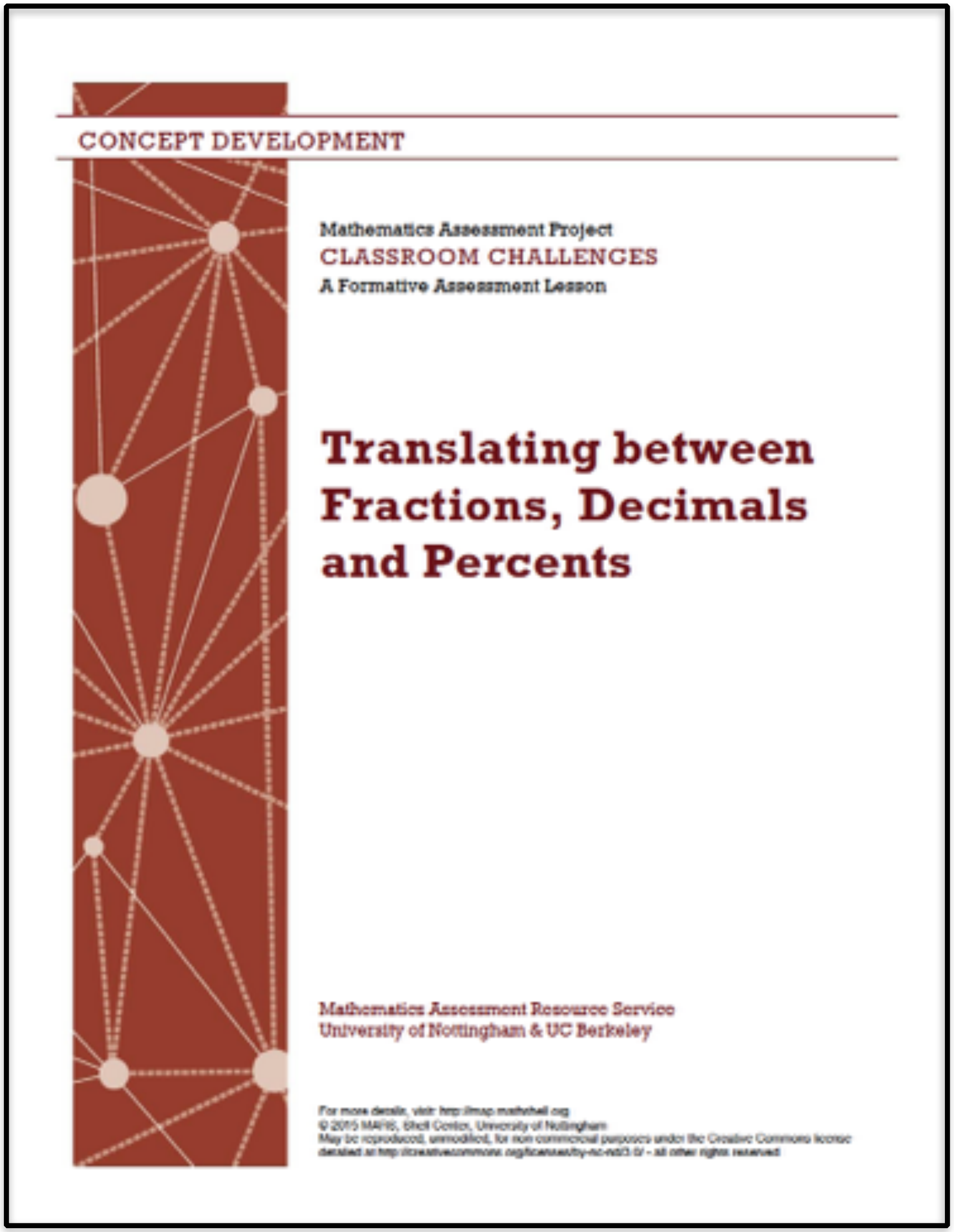
If we had a lot of time, we would look at a bunch of videos and discuss what we see in them.

But we don’t. So, I’ll show you one 6^{th} grade teaser and ask you to think about the wide range of classrooms you’ve seen, pre-school to graduate school.

Tape 3: a 6th grade classroom in an inner city, low income Chicago school.

The context:

a "Formative Assessment Lesson" entitled "translating between fractions, decimals, and percents."



This lesson is available for free, along with 99 other formative assessment lessons (a.k.a. "Classroom Challenges"). Just google "mathematics assessment" to find the Mathematics Assessment Project website.
To date we have more than 5,000,000 lesson downloads. (More later.)

The task starts with decimals and percents.

0.2 ___%	0.05 ___%	_.___ 80%
0.375 ___%	_.___ 12.5%	0.75 ___%
1.25 ___%	_.___ 50%	_.___ ___%

Working Together 1

Take turns to:

1. Fill in the missing decimals and percents.
2. Place a number card where you think it goes on the table, from smallest on the left to largest on the right.
3. Explain your thinking.
4. The other members of your group must check and challenge your explanation if they disagree.
5. Continue until you have placed all the cards in order.
6. Check that you all agree about the order. Move any cards you need to, until everyone in the group is happy with the order.

Then students are given area cards,

Area A

Fraction cards,

$$\frac{3}{8}$$

And scales,

Scale A

And asked to order them all.

Working Together 2

Take turns to:

1. Match each area card to a decimals/percents card.

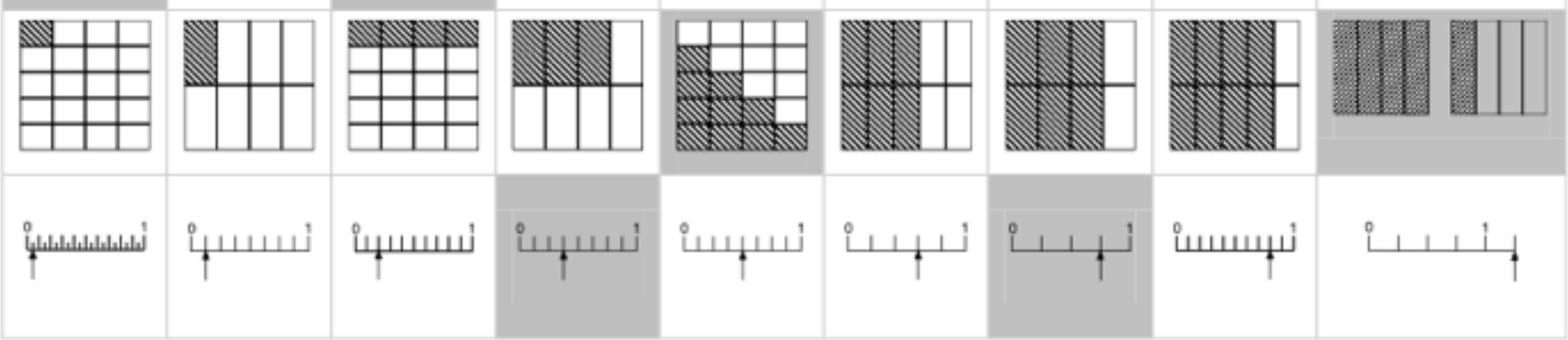
2. Create a new card or fill in spaces on cards until all the cards have a match.

3. Explain your thinking to your group. The other members of your group must check and challenge your explanation if they disagree.

4. Place your cards in order, from smallest on the left to largest on the right. Check that you all agree about the order. Move any cards you need to, until you are all happy with the order.

The complete answer set (decimals, %, fractions, area, measure)

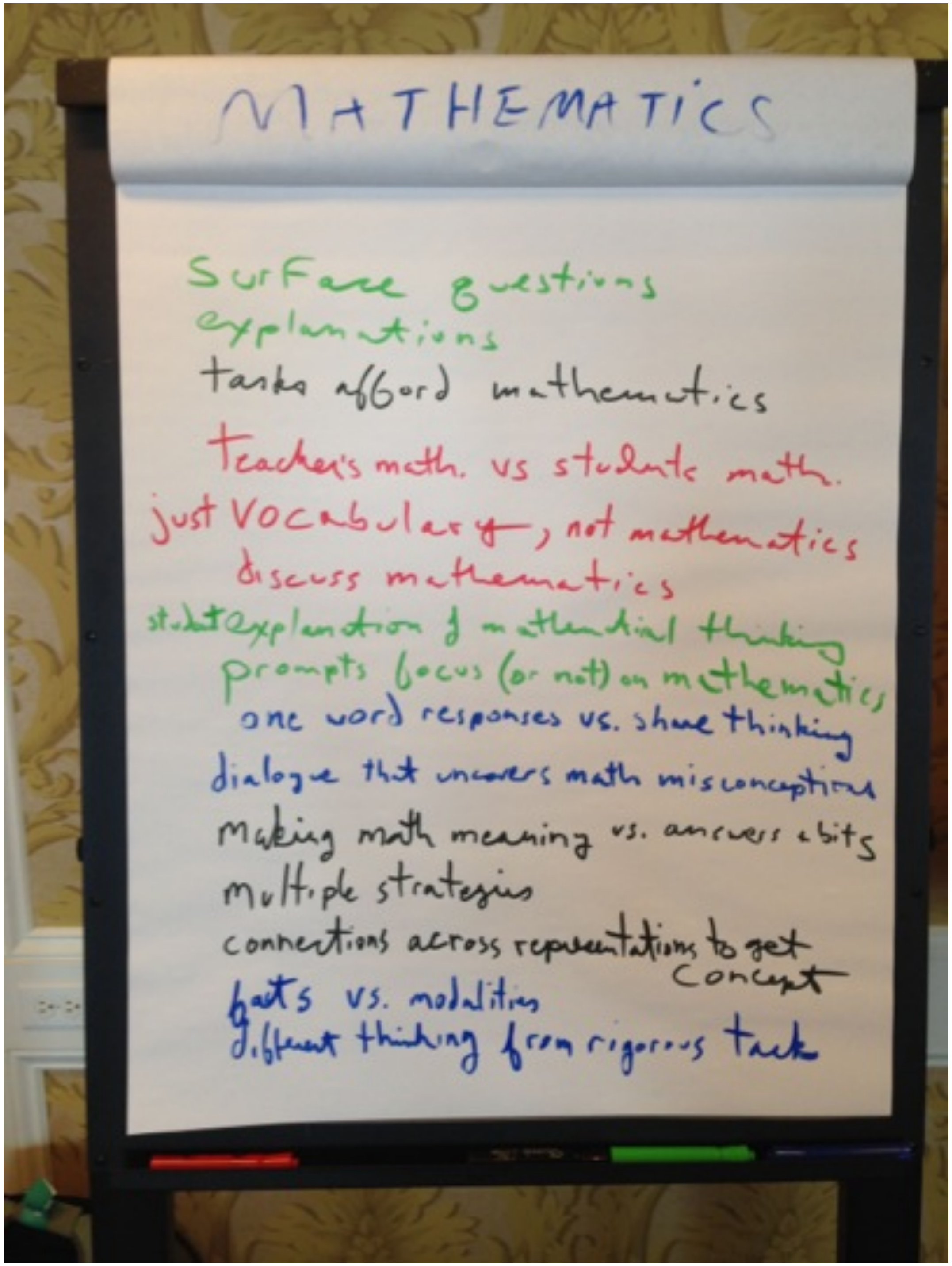
0.05 5%	0.125 12.5%	0.2 20%	0.375 37.5%	0.5 50%	0.6 60%	0.75 75%	0.8 80%	1.25 125%
$\frac{1}{20}$	$\frac{1}{8}$	$\frac{1}{5}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{6}{10}$	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{5}{4}$



VIDEO GOES HERE

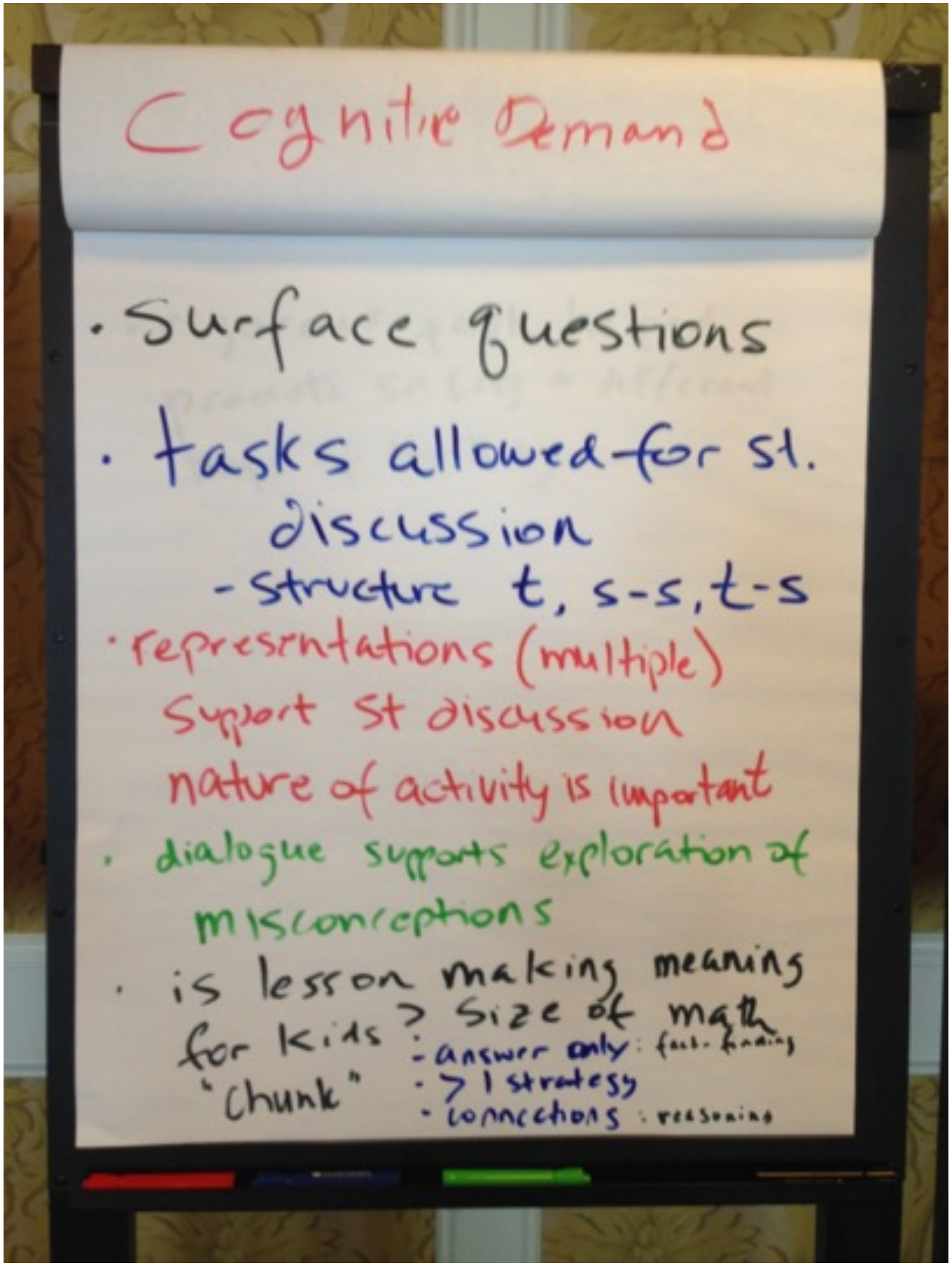
Every time a group looks at videos, there are lots of comments about what the teachers are doing, and what it must feel like to be a student in their classrooms.

And every time, it is easy to organize everything they say into five categories:



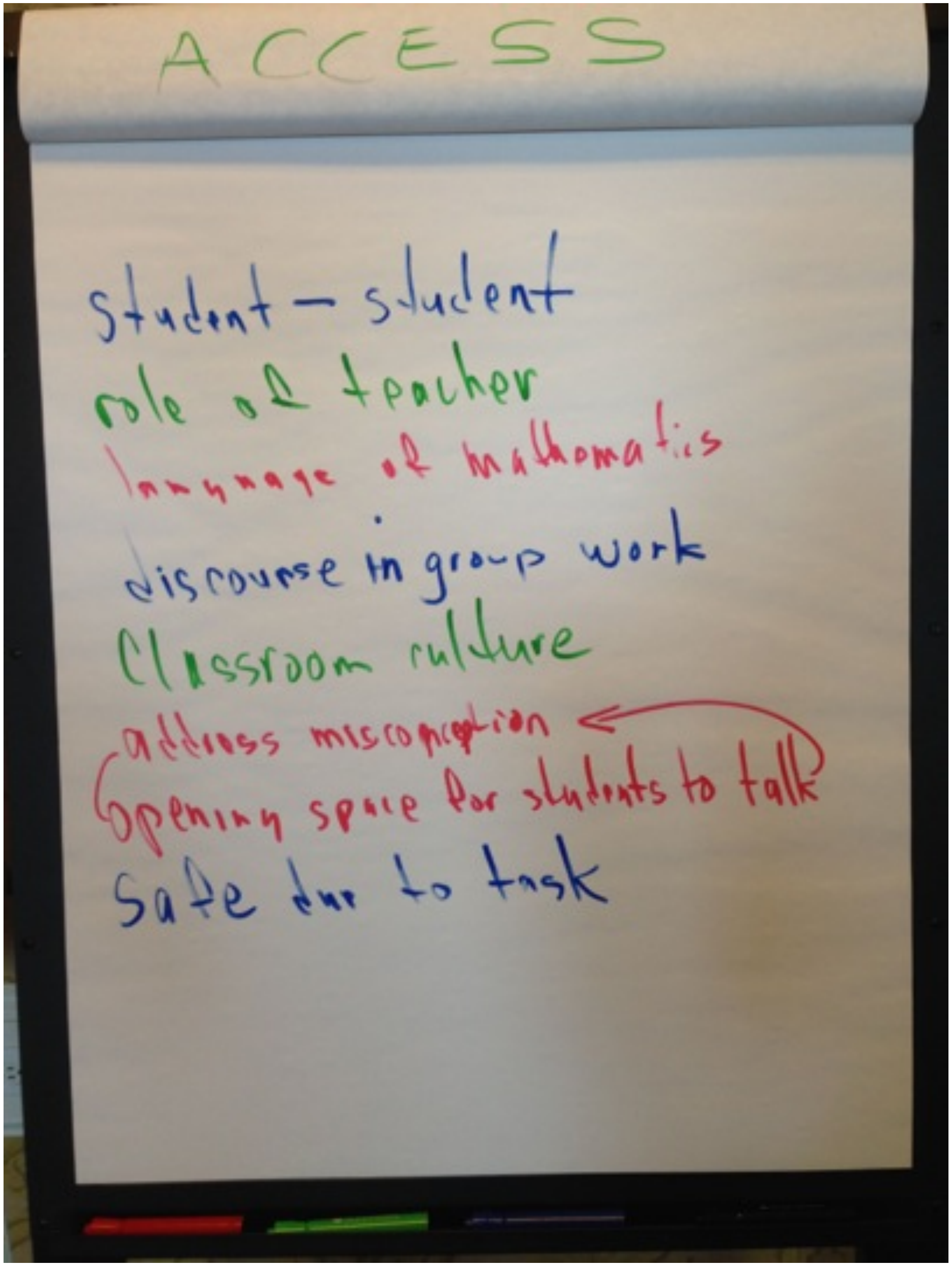
The Mathematics

Is it important, coherent, connected? Where are the big ideas? Are there opportunities for thinking and problem solving?



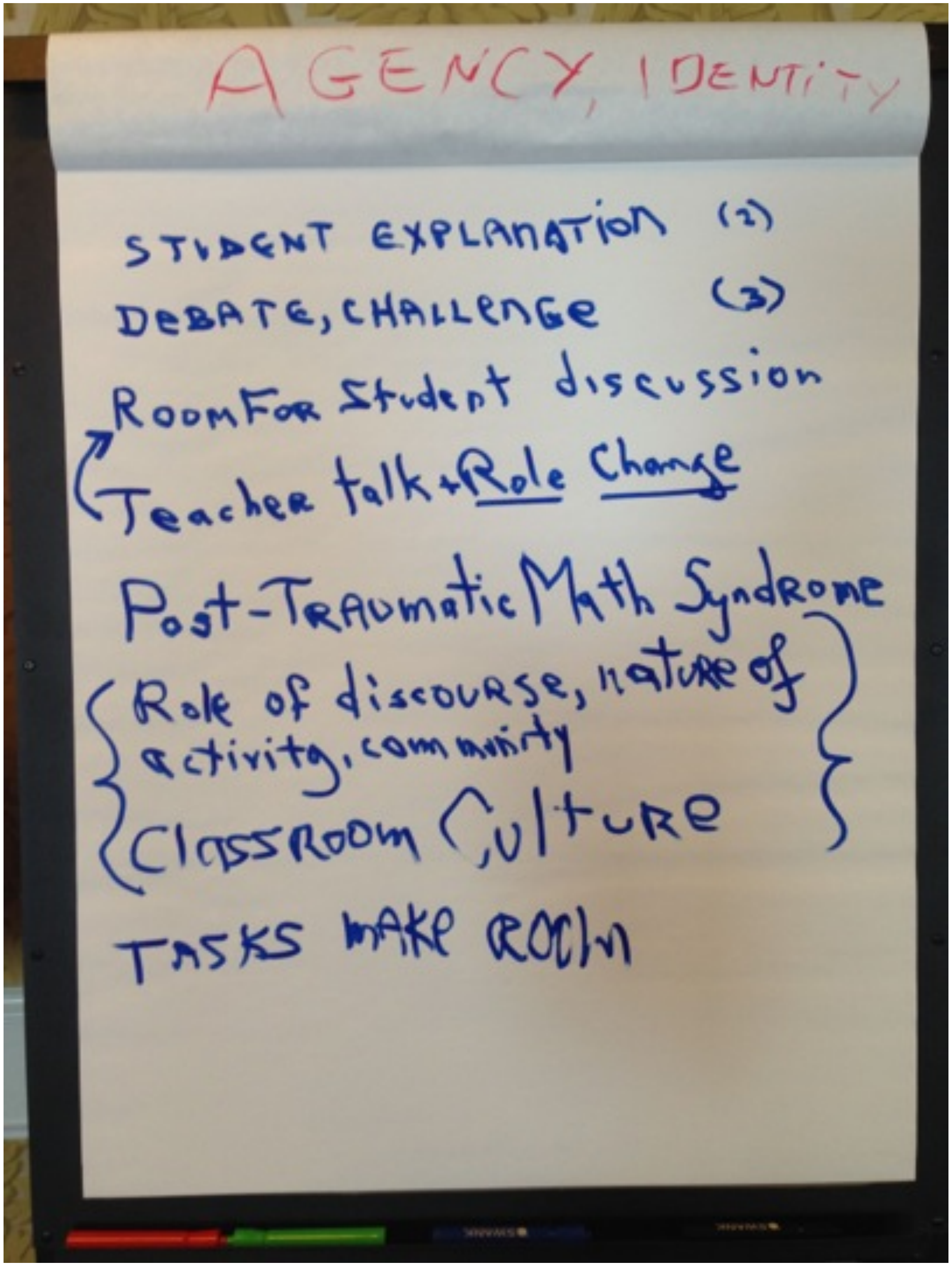
Cognitive Demand

Do the students have opportunities for sense making – for "productive struggle," engaging productively with the mathematics?



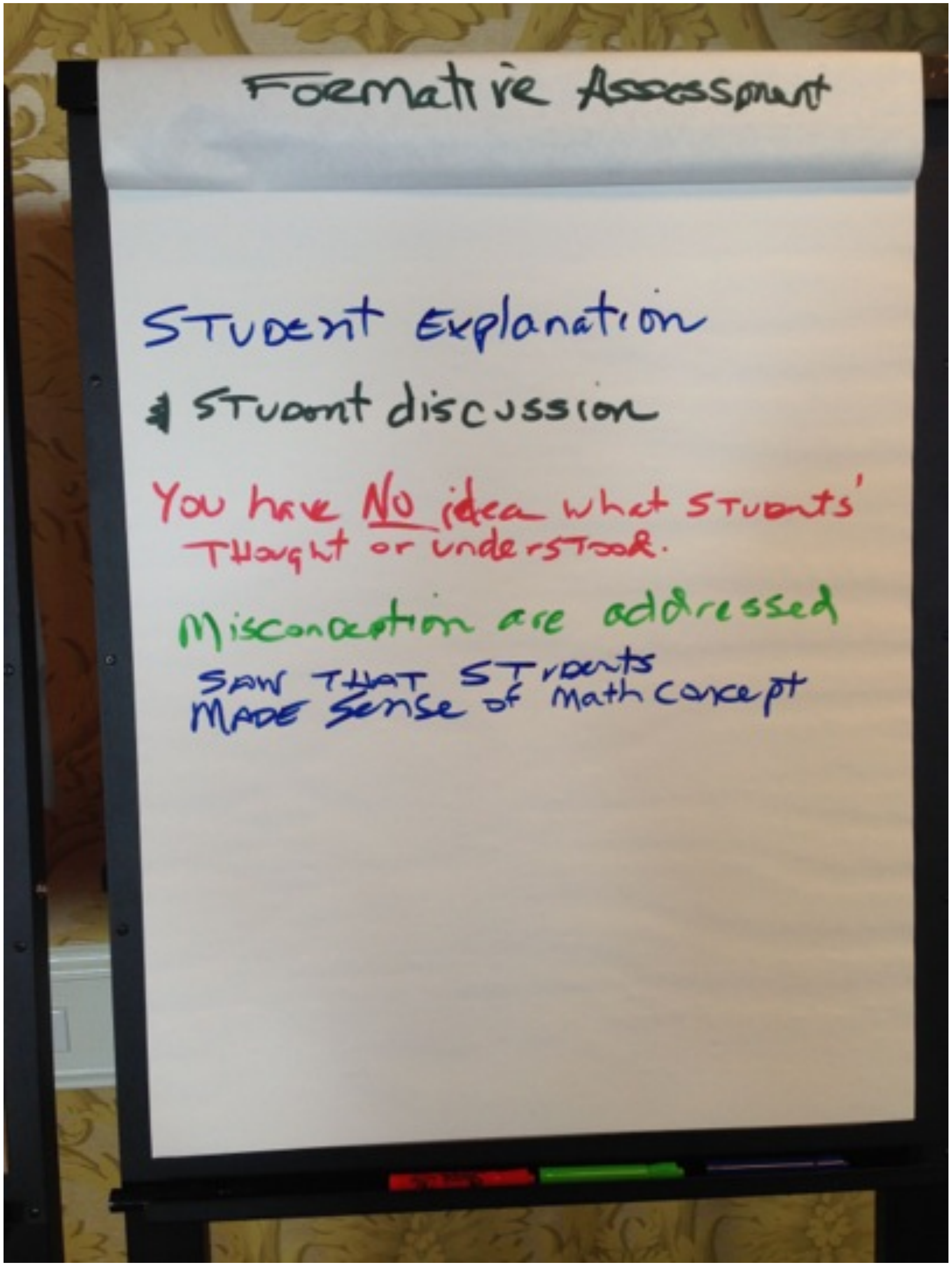
Access and Equity

Who participates, in what ways? Are there opportunities for *every* student to engage in sense making?



Agency and Identity

Do students have the opportunities to do and talk mathematics? Do they come to see themselves as "math people," or people who cannot do mathematics?



Formative Assessment

Does classroom discussion reveal what students understand, so that instruction can be adjusted for purposes of helping students learn?

These are the five dimensions of **T**eaching for **R**obust **U**nderstanding of **M**athematics, or …

– **TRU Math** –

The Five Dimensions of Mathematically Powerful Classrooms

The Mathematics	Cognitive Demand	Access to Mathematical Content	Agency, Authority, and Identity	Formative Assessment
The extent to which the mathematics discussed is focused and coherent, and to which connections between procedures, concepts and contexts (where appropriate) are addressed and explained. Students should have opportunities to learn important mathematical content and practices, and to develop productive mathematical habits of mind.	*The extent to which classroom interactions create and maintain an environment of productive intellectual challenge conducive to students' mathematical development. There is a happy medium between spoon-feeding mathematics in bite-sized pieces and having the challenges so large that students are lost at sea.*	*The extent to which classroom activity structures invite and support the active engagement of all of the students in the classroom with the core mathematics being addressed by the class. No matter how rich the mathematics being discussed, a classroom in which a small number of students get most of the "air time" is not equitable.*	*The extent to which students have opportunities to conjecture, explain, make mathematical arguments, and build on one another's ideas, in ways that contribute to their development of agency (the capacity and willingness to engage mathematically) and authority (recognition for being mathematically solid), resulting in positive identities as doers of mathematics.*	*The extent to which the teacher solicits student thinking and subsequent instruction responds to those ideas, by building on productive beginnings or addressing emerging misunderstandings. Powerful instruction "meets students where they are" and gives them opportunities to move forward.*

What’s New, What’s Different?

In a sense, nothing.

That is,

You should recognize and resonate to everything in TRU.

It captures what we know is important. It doesn’t offer any “magic bullets” or surprises.

So, What’s Different?

TRU is:

\- Comprehensive -

\- Easy to remember -

\- Easy to work on/with -

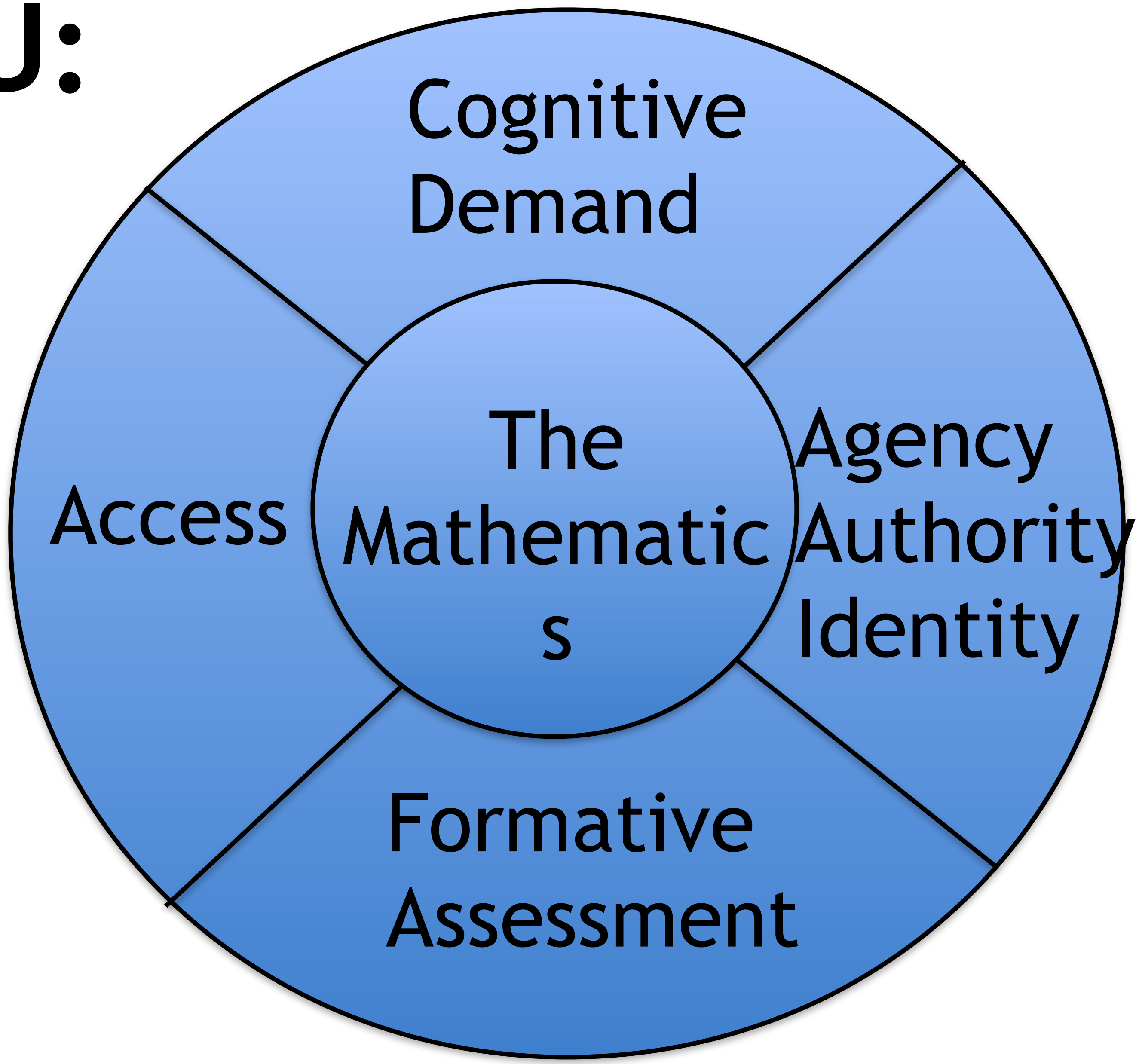
\- It’s a natural frame for PD -

There’s one problem with what you’ve seen thus far.

Text is linear, but the ideas aren’t.

So let me re-frame a bit…

TRU:


Cognitive
Demand
Access
The
Mathematic
s
Agency
Authority
Identity
Formative
Assessment

Any classroom, from pre-K through graduate school, that does well on these five dimensions, will produce students who are powerful mathematical thinkers.

It follows that instructional materials, professional development, and classroom observations will be most powerful if they are aligned with these five dimensions.

So much evidence, so little time…

See

http://map.mathshell.org

and

http://ats.berkeley.edu

for evidence, and for the tools I’m about to show you.

Before proceeding, it’s ESSENTIAL to understand:

TRU is NOT a tool or set of tools.

TRU is a perspective regarding what counts in instruction, and

TRU provides a language for talking about instruction in powerful ways.

With this understanding, you can make use of any productive tools wisely.

But, we have tools.

(of course.)

TRU contains and aligns with a large set of tools produced by the Mathematics Assessment and the Algebra Teaching Study Projects.

Part 2:

Tools for supporting powerful classroom instruction-

a. Formative Assessment lessons
b. Planning, Reflection, and
c. Classroom Observation Tools

I’ve shown you the bare bones structure of one FAL.

I want to work through another, to show how beautifully the FALs mesh with TRU Math.

CONCEPT DEVELOPMENT

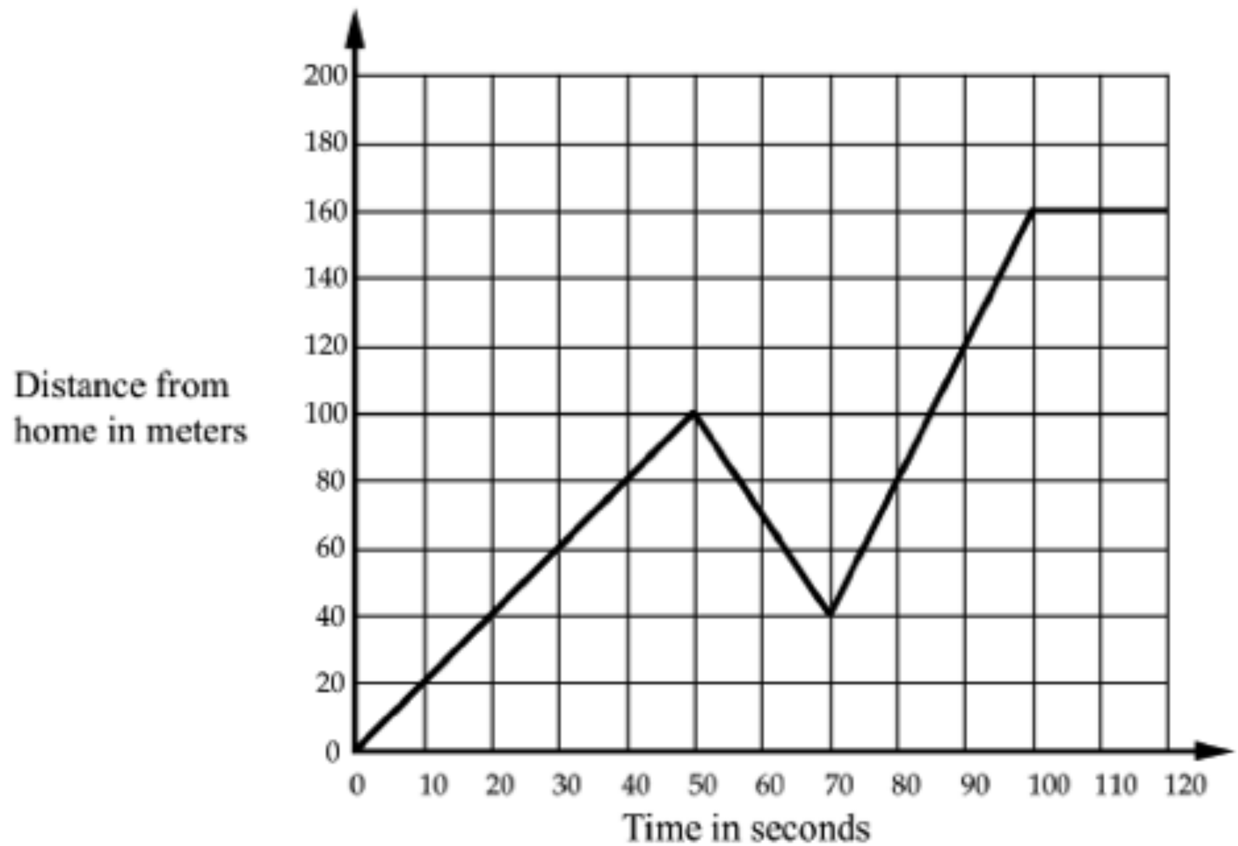
Mathematics Assessment Project
CLASSROOM CHALLENGES
A Formative Assessment Lesson

Interpreting Distance-Time Graphs

Mathematics Assessment Resource Service
University of Nottingham & UC Berkeley
Beta Version

Before the lesson devoted to this topic, we give a diagnostic problem as homework:

Every morning Tom walks along a straight road from his home to a bus stop, a distance of 160 meters. The graph shows his journey on one particular day.



Describe what may have happened. Is the graph realistic? Explain.

We point to typical student misconceptions and offer suggestions about how to address them…

Common Issue	Possible questions and prompts
Student interprets the graph as a picture E.g. as the graph goes up and down, Tom's path goes up and down.	• If a person walked at a steady speed up and down a hill, *directly away from home*, what would the graph look like?
Student interprets graph as speed–time E.g. The student has interpreted a positive slope as speeding up and a negative slope as slowing down.	• How can you tell if Tom is traveling away from or towards home?
Student fails to mention distance or time E.g. The student has not worked out the speed of some/all sections of the journey.	• Can you provide more information about how far Tom has traveled during different sections of his journey?
Student fails to calculate and represent speed	• Can you provide information about Tom's speed for all sections of his journey?
Student adds little explanation as to why the graph is or is not realistic	• Is Tom's fastest speed realistic? Is Tom's slowest speed realistic? Why?/Why not?

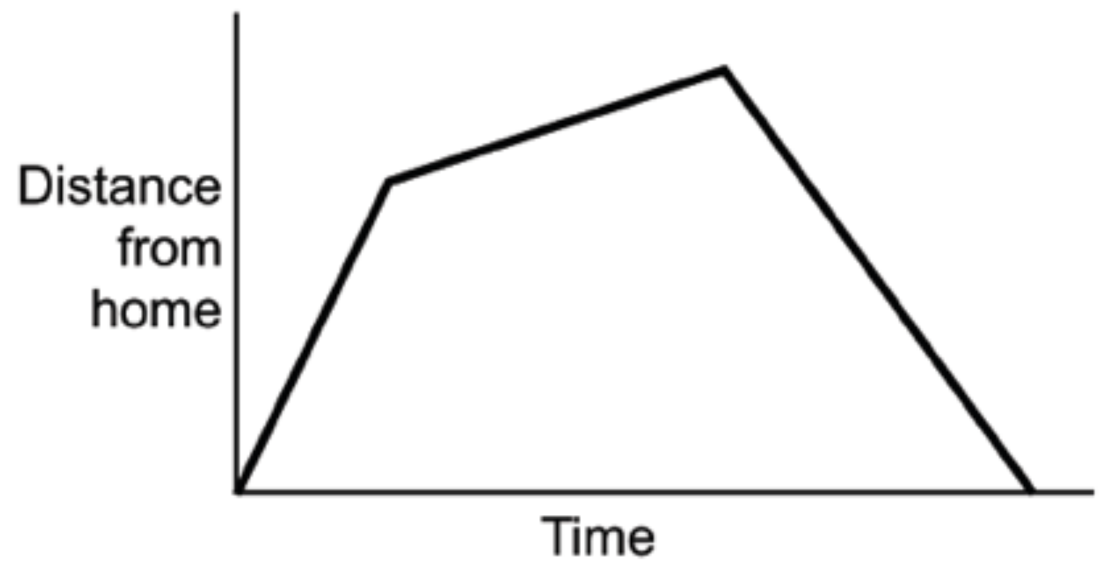
The lesson itself begins with a diagnostic task…

Matching a Graph to a Story

A. Tom took his dog for a walk to the park. He set off slowly and then increased his pace. At the park Tom turned around and walked slowly back home.

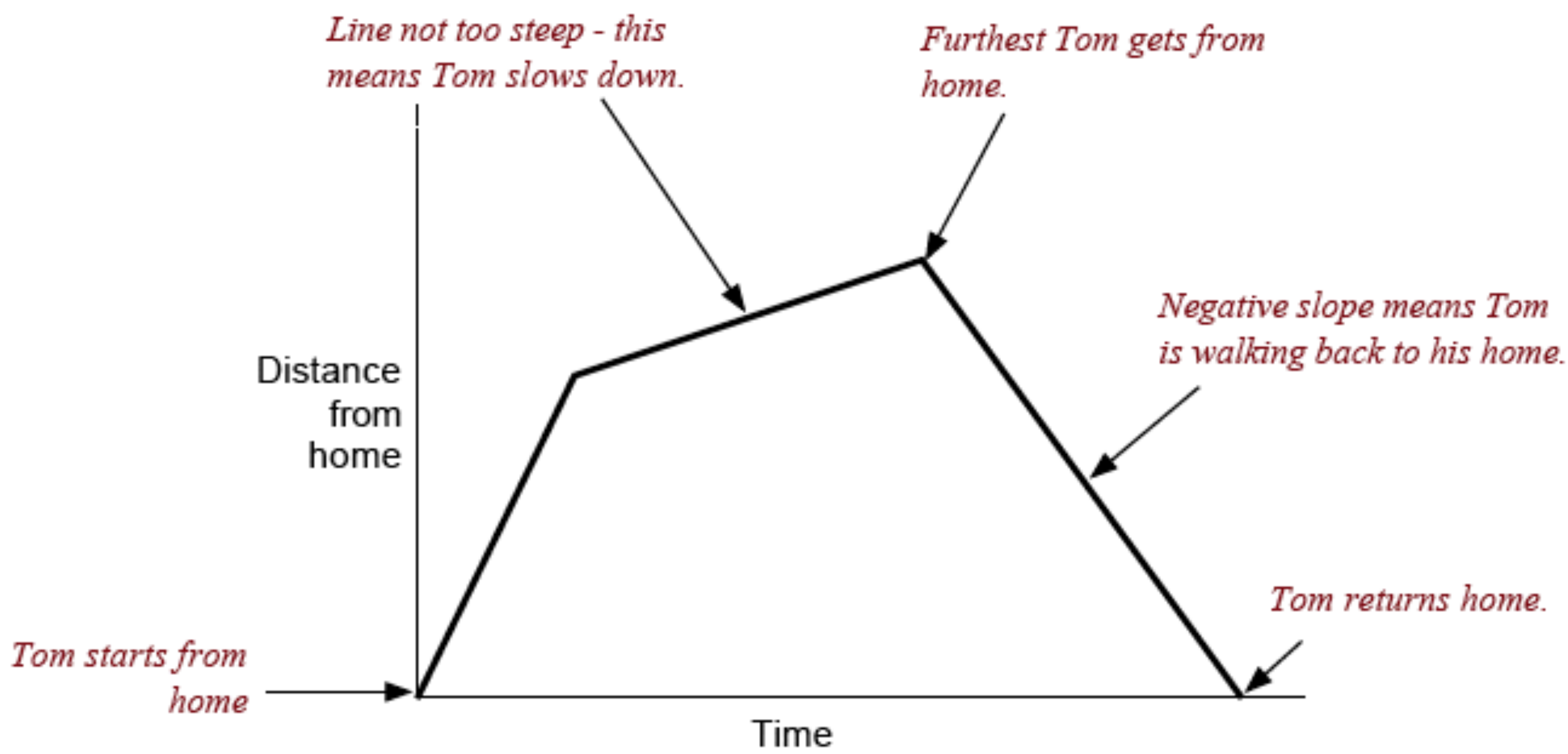
B. Tom rode his bike east from his home up a steep hill. After a while the slope eased off. At the top he raced down the other side.

C. Tom went for a jog. At the end of his road he bumped into a friend and his pace slowed. When Tom left his friend he walked quickly back home.

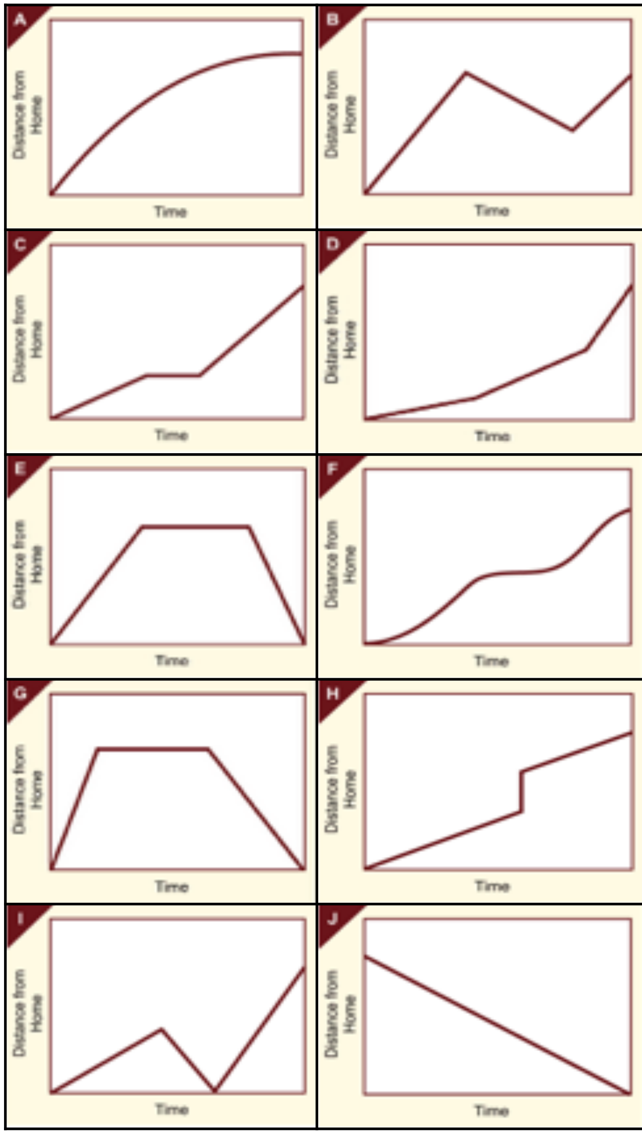


Students are given the chance to annotate and explain…

A graph may end up looking like this:



Matching stories to graphs- students make posters



1 Tom ran from his home to the bus stop and waited. He realized that he had missed the bus so he walked home.

2 Opposite Tom's home is a hill. Tom climbed slowly up the hill, walked across the top, and then ran quickly down the other side.

3 Tom skateboarded from his house, gradually building up speed. He slowed down to avoid some rough ground, but then speeded up again.

4 Tom walked slowly along the road, stopped to look at his watch, realized he was late, and then started running.

5 Tom left his home for a run, but he was unfit and gradually came to a stop!

6 Tom walked to the store at the end of his street, bought a newspaper, and then ran all the way back.

7 Tom went out for a walk with some friends. He suddenly realized he had left his wallet behind. He ran home to get it and then had to run to catch up with the others.

8 This graph is just plain wrong. How can Tom be in two places at once?

9 After the party, Tom walked slowly all the way home.

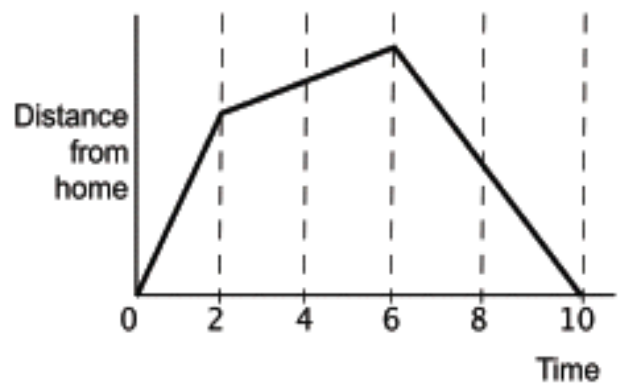
10 Make up your own story!

Students work on converting graphs to tables:

Whole-class discussion: Interpreting tables (15 minutes)

Bring the class together and give each student a mini-whiteboard, a pen, and an eraser. Display Slide 5 of the projector resource:

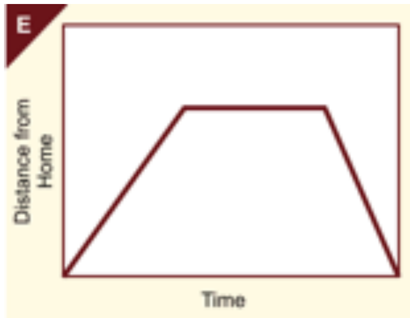
Making Up Data for a Graph

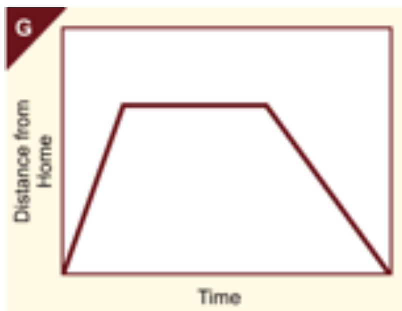


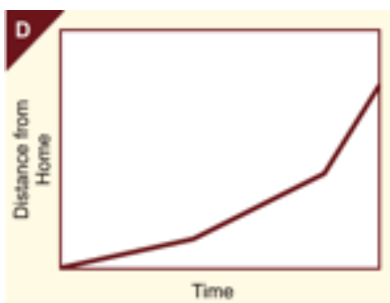
Time	Distance
0	
2	
4	
6	
8	
10	

On your whiteboard, create a table that shows possible times and distances for Tom's journey.

Tables are added to the card sort…







2

Opposite Tom's home is a hill. Tom climbed slowly up the hill, walked across the top, and then ran quickly down the other side.

1

Tom ran from his home to the bus stop and waited.
He realized that he had missed the bus so he walked home.

6

Tom walked to the store at the end of his street, bought a newspaper, and then ran all the way back.

Q

Time	Distance
0	0
1	10
2	20
3	40
4	60
5	120

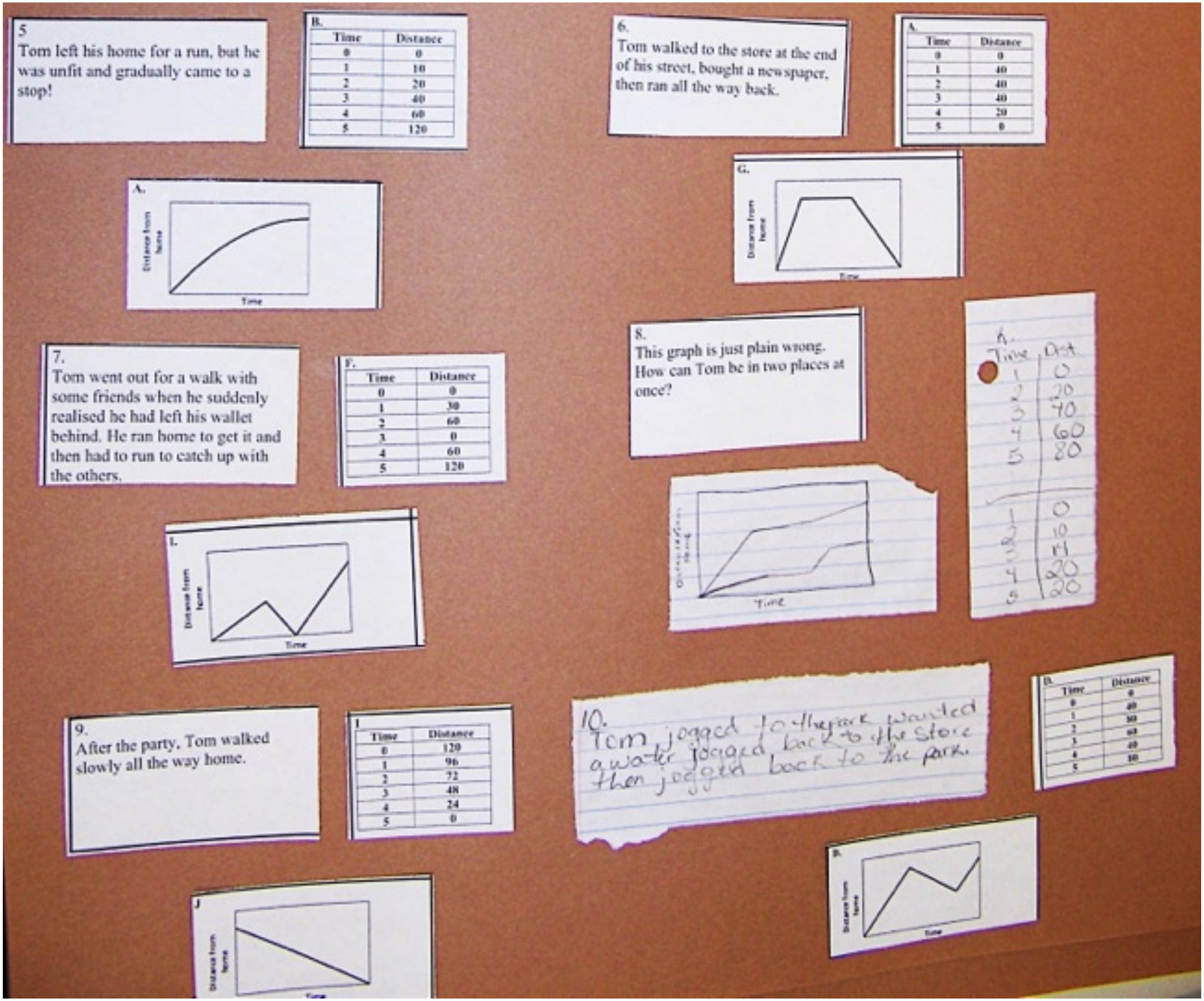
P

Time	Distance
0	0
1	40
2	40
3	40
4	20
5	0

T

Time	Distance
0	0
1	20
2	40
3	40
4	40
5	0

And the class compares solutions together


5
Tom left his home for a run, but he was unfit and gradually came to a stop!
B.
Time Distance
0 0
1 10
2 20
3 40
4 60
5 120
A.
6.
Tom walked to the store at the end of his street, bought a newspaper, then ran all the way back.
A.
Time Distance
0 0
1 40
2 40
3 40
4 20
5 0
G.
7.
Tom went out for a walk with some friends when he suddenly realised he had left his wallet behind. He ran home to get it and then had to run to catch up with the others.
F.
Time Distance
0 0
1 30
2 60
3 0
4 60
5 120
I.
8.
This graph is just plain wrong. How can Tom be in two places at once?
Time
Time Dist
1 0
2 20
3 40
4 60
5 80
9.
After the party, Tom walked slowly all the way home.
I
Time Distance
0 120
1 96
2 72
3 48
4 24
5 0
10.
Tom jogged to the park wanted a water jogged back to the store then jogged back to the park.
D.
J
B.

Now, let’s look at this FAL one dimension at a time, to see how the design supports doing well along the 5 dimensions of TRU.

The Mathematics

How rich - connected, conceptual - is the mathematical content?

The lesson focuses on developing deep understandings of concepts like slope, and its use to describe real world phenomena; it provides opportunities to make connections across different representations (graphs, tables, stories.)

Cognitive Demand

To what extent are students supported in grappling with and making sense of mathematical concepts?

The card sort and poster activities provide plenty of room for sense making – IF the students are gently scaffolded when they need it. (Remember the list of support questions)

Access to Mathematical Content

To what extent does the teacher support access to the content of the lesson for all students?

The classroom structures – which include whole group conversations, small group work, and student poster presentations – provide *opportunities* for teachers to support every student in engaging meaningfully with the mathematics. But . . . this takes hard work, even with the opportunities.

Agency, Authority, and Identity

To what extent are students the source of ideas and discussion of them? How are student contributions framed?

The classroom structures – which include whole group conversations, small group work, and student poster presentations – provide *opportunities* for teachers to support every student in building powerful mathematical identities. But . . . this takes hard work, even with the opportunities.

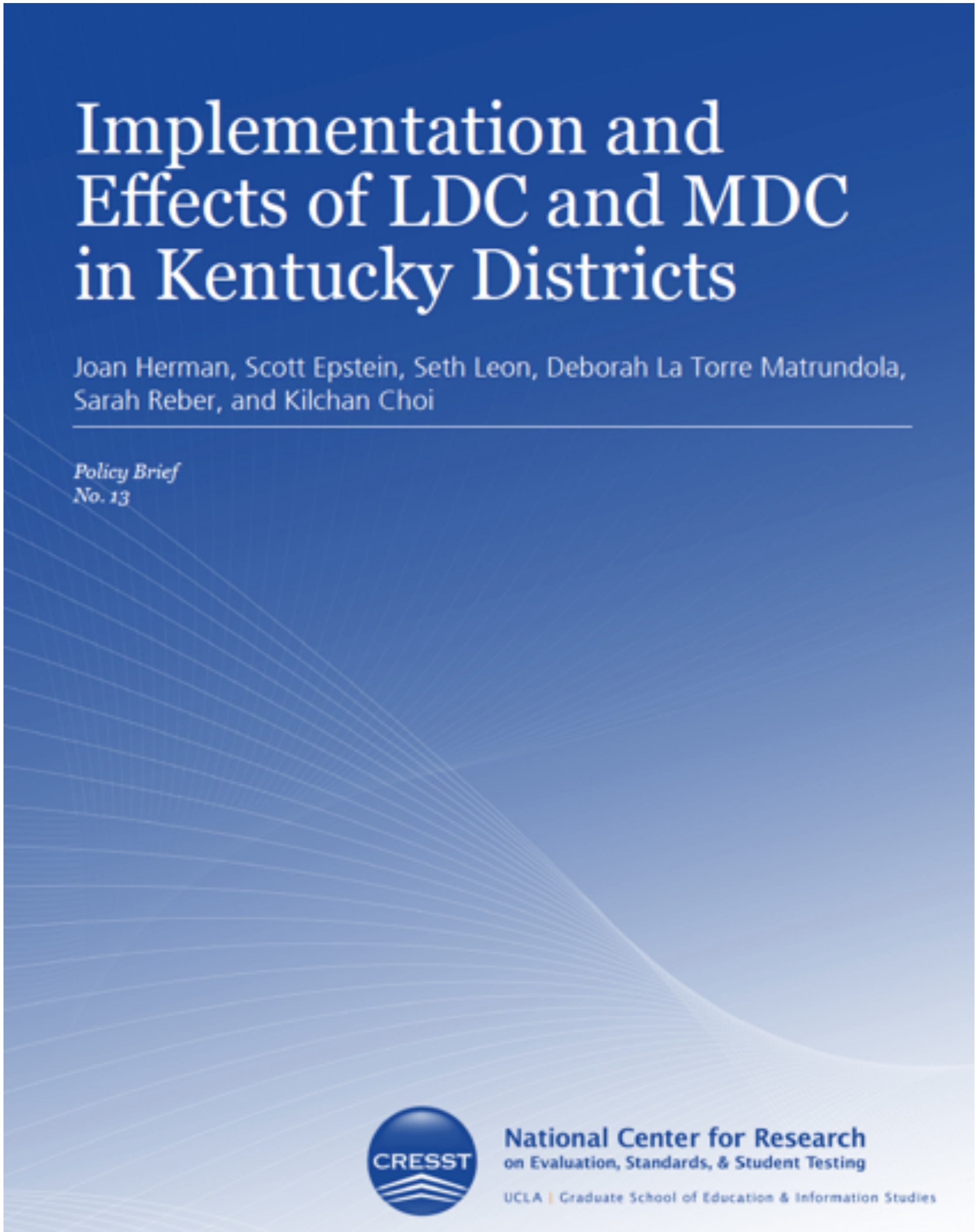
Formative Assessment

To what extent is students' mathematical thinking surfaced; to what extent does instruction build on student ideas when potentially valuable or address

They're called **Formative Assessment Lessons** for a reason…

☺

So, does this stuff really work?



MDC = "Math design Collaborative," which was designed to help Kentucky Teachers implement the Formative Assessment Lessons.

The results:

“For MDC, participating teachers were expected to implement between four and six Challenges, meaning that **students were engaged only 8-12 days of the school year…**

Nonetheless, the studies found **statistically significant learning effects… the approximate equivalent of 4.6 months for MDC.** Given their contexts of early implementation and limited dosage, these small effects are noteworthy.”

b. Tools for Planning, Reflection, and Observation

Welcome to the TRU Math Conversation Guide.

The idea is to exploit the dimensions of TRU Math as arenas for reflecting on one's teaching –
in planning, in reflecting on how things have gone, and in thinking about next steps.

Start with the core questions:

The Mathematics

How do mathematical ideas from this unit/course develop in this lesson/lesson sequence?

Cognitive Demand

What opportunities do students have to make their own sense of mathematical ideas?

Access to Mathematical Content

Who does and does not participate in the mathematical work of the class, and how?

Agency, Authority, and Identity

What opportunities do students have to explain their own and respond to each other's mathematical ideas?

Uses of Assessment

What do we know about each student's current mathematical thinking, and how can we build on it?

. . . and expand them.

Before a lesson, you can ask:

- How can I use the five dimensions to enhance my lesson planning?

After a lesson, you can ask:

- How well did things go? What can I do better next time?

Planning next Steps, you can ask:

- How can I build on what I've learned?

I’m going to flip through the guide to show you what it looks like, and make a quick stop at “access” to illustrate the kind of conversations it’s intended to support.

The Mathematics

Core Question: How do mathematical ideas from this unit/course develop in this lesson/lesson sequence?

Students often experience mathematics as a set of isolated facts, procedures and concepts, to be rehearsed, memorized, and applied. Our goal is to instead give students opportunities to experience mathematics as a coherent and meaningful discipline. This means identifying the important mathematical ideas behind facts and procedures, highlighting connections between skills and concepts, and relating concepts to each other—not just in a single lesson, but also across lessons and units. It also means engaging students with centrally important mathematics in an active way, so that they can make sense of concepts and ideas for themselves and develop robust networks of understanding.

The Mathematics

Pre-observation	Reflecting After a Lesson	Planning Next Steps
How will important mathematical ideas develop in this lesson and unit?	How did students actually engage with important mathematical ideas in this lesson?	How can we connect the mathematical ideas that surfaced in this lesson to future lessons?

Think about:

- The mathematical goals for the lesson

Cognitive Demand

Core Question: What opportunities do students have to make their own sense of mathematical ideas

We want students to engage authentically with important mathematical ideas, not simply receive knowledge. This requires students to engage in productive struggle. They need to be supported in these struggles so that they aren't lost, but at the same time, support should maintain students' opportunities to grapple with important ideas and difficult problems. Finding a balance is difficult, but our goal is to help students understand the challenges they confront, while leaving them room to make their own sense of those challenges.

Cognitive Demand

Pre-observation	Reflecting After a Lesson	Planning Next Steps
What opportunities will students have to make their own sense of important mathematical ideas?	What opportunities did students have to make their own sense of important mathematical ideas?	How can we create more opportunities for students to make their own sense of important mathematical ideas?

Think about:

- What opportunities exist for students to struggle with mathematical ideas

Access to Mathematical Content

Core Question: Who does and does not participate in the mathematical work of the class, and how

All students should have access to opportunities to develop their own understandings of rich mathematics, and to build productive mathematical identities. For any number of reasons, it can be extremely difficult to provide this access to everyone, but that doesn't make it any less important! We want to challenge ourselves to recognize who has access and when. There may be mathematically rich discussions or other mathematically productive activities in the classroom—but who gets to participate in them? Who might benefit from different ways of organizing classroom activity?

Access to Mathematical Content

Pre-observation	Reflecting After a Lesson	Planning Next Steps
What opportunities exist for each student to participate in the mathematical work of the class?	Who did and didn't participate in the mathematical work of the class, and how?	How can we create opportunities for each student to participate in the mathematical work of the class?

Think about:

- The range of ways students can and do participate in the mathematical work of the class (talking, writing, leaning in,

Agency, Authority, and Identity

Core Question: What opportunities do students have to explain their own and respond to each other's mathematical ideas?

Many students have negative beliefs about themselves and mathematics, for example, that they are "bad at math," or that math is just a bunch of facts and formulas that they're supposed to memorize. Our goal is to support all students—especially those who have not been successful with mathematics in the past—to develop a sense of mathematical agency and authority. We want students to come to see themselves as mathematically capable and competent—not by giving them easy successes, but by engaging them as sense-makers, problem solvers, and creators of mathematical ideas.

Agency, Authority, and Identity

Pre-observation	Reflecting After a Lesson	Planning Next Steps
What opportunities exist in the lesson for students to explain their own and respond to each other's mathematical ideas?	What opportunities did students have to explain their own and respond to each other's mathematical ideas?	What opportunities can we create in future lessons for more students to explain their own and respond to each other's mathematical ideas?

Think about:

- Who generates the mathematical ideas that get discussed

Formative Assessment

Core Question: What do we know about each student's current mathematical thinking, and how can we build on it?

We want instruction to be responsive to students' actual thinking, not just our hopes or assumptions about what they do and don't understand. It isn't always easy to know what students are thinking, much less to use this information to shape classroom activities—but we can craft tasks and ask purposeful questions that give us insights into the strategies students are using, the depth of their conceptual understanding, and so on. Our goal is to then use those insights to guide our instruction, not just to fix mistakes but to integrate students' understandings, partial though they may be, and build on them.

Formative Assessment

Pre-observation	Reflecting After a Lesson	Planning Next Steps
What do we know about each student's current mathematical thinking, and how does this lesson build on it?	What did we learn in this lesson about each student's mathematical thinking? How was this thinking built on?	Based on what we learned about each student's mathematical thinking, how can we (1) learn more about it and (2) build on it?

Think about:

- What opportunities exist for students to develop their own strategies and approaches.

Imagine teachers and coaches planning together, watching each other teach, and debriefing using these ideas.

What’s critically important is to make thinking like this a habit, so you think about these issues all the time – in planning, in teaching, in reflecting.

We’ve built distilled versions that are useful in watching videos in PD, or for keeping “at the top of your head” for reflection.

Here are two.

Looking at a lesson:

The Mathematics	• Are students learning important mathematics? • Are opportunities made for meaningful connections?
Cognitive Demand	• How long do students spend on each prompt? • Do they engage in productive struggle? • Do teacher questions invite explanations or answers?
Access to Mathematical Content	• Are there multiple ways to get involved productively? • Does the teacher ask a range of students to respond?
Agency, Authority, and Identity	• Who explains most: the teacher or the students? • Do the students give extended explanations?
Formative Assessment	• Does the teacher follow up on student responses? • Does the teacher vary the lesson in the light of student responses?

Even better: experience the lesson as a student.

The Mathematics	• What's the big mathematical idea in this lesson? • How does it connect to what I already know?
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?
Access to Mathematical Content	• Do I get to participate in meaningful math learning? • Can I hide or be ignored?
Agency, Authority, and Identity	• Do I get to explain, to present my ideas? Are they built on? • Am I recognized as being capable and able to contribute in meaningful ways?
Formative Assessment	• Do classroom discussions include my thinking? • Does instruction respond to my thinking and help me think more deeply?

c. A formal Classroom Observation Rubric

The TRU Math Classroom Observation Rubric was designed to capture the richness of classroom interactions along the five dimensions in the TRU Math framework. It can help to locate where a teacher’s current practices are, and identify where to go next. (It lays out a developmental trajectory along the 5 dimensions of TRU).

Summary Rubric

	The Mathematics	Cognitive Demand	Access to Mathematical	Agency, Authority, and Identity	Formative Assessment
	How rich - conceptual, connected - is the mathematical content?	*To what extent are students supported in grappling with and making sense of mathematical concepts?*	*To what extent does the teacher support access to the content of the lesson for all students?*	*To what extent are students the source of ideas and discussion of them? How are student contributions framed?*	*To what extent is students' mathematical thinking surfaced; to what extent does instruction build on student ideas when potentially valuable or address misunderstandings when they arise?*
1	Classroom activities are unfocused or skills-oriented, lacking opportunities for engagement in key practices such as reasoning and problem solving.	Classroom activities are structured so that students mostly apply memorized procedures and/or work routine exercises.	There is differential access to or participation in the mathematical content, and no apparent efforts to address this issue.	The teacher initiates conversations. Students' speech turns are short (one sentence or less), and constrained by what the teacher says or does.	Student reasoning is not actively surfaced or pursued. Teacher actions are limited to corrective feedback or encouragement.
2	Activities are primarily skills-oriented, with cursory connections between procedures, concepts and contexts (where appropriate) and minimal attention to key practices.	Classroom activities offer possibilities of conceptual richness or problem solving challenge, but teaching interactions tend to "scaffold away" the challenges, removing opportunities for productive struggle.	There is uneven access or participation but the teacher makes some efforts to provide mathematical access to a wide range of students.	Students have a chance to explain some of their thinking, but "the student proposes, the teacher disposes": in class discussions, student ideas are not explored or built upon.	The teacher refers to student thinking, perhaps even to common mistakes, but specific students' ideas are not built on (when potentially valuable) or used to address challenges (when problematic).
3	Classroom activities support meaningful connections between procedures, concepts and contexts (where appropriate) and provide opportunities for engagement in key practices.	The teacher's hints or scaffolds support students in productive struggle in building understandings and engaging in mathematical practices.	The teacher actively supports and to some degree achieves broad and meaningful mathematical participation; **OR** what appear to be established participation structures result in such engagement.	Students explain their ideas and reasoning. The teacher may ascribe ownership for students' ideas in exposition, **AND/OR** students respond to and build on each other's ideas.	The teacher solicits student thinking and subsequent instruction responds to those ideas, by building on productive beginnings or addressing emerging misunderstandings.

You can use TRU to score teachers…

I can’t stop you.

But Remember:

The most important use of a yardstick is to measure growth.

The idea is that TRU can establish goals, and help you reach them.

We're building observational tools on iPads that you can take notes (and pictures) on, as a basis for professional conversations.

To conclude:
TRU is not a tool or set of tools.

TRU a way of thinking about what counts – in planning, in teaching, in reflecting.

If its use becomes habitual – if TRU frames the way you think about what students experience – then students will be powerful thinkers and problem solvers.

Resources:

The TRU Math Suite and supporting documents are available on The Algebra Teaching Study web site:

http://ats.berkeley.edu/

under "tools" and "publications" tabs

and

The Mathematics Assessment Project web site: http://map.mathshell.org/

under "TRU Math Suite" tab

(Just Google the project names.)