

Strategies for Success: Using Asset-Based Perspectives to Transform Our Classrooms



Joleigh Honey

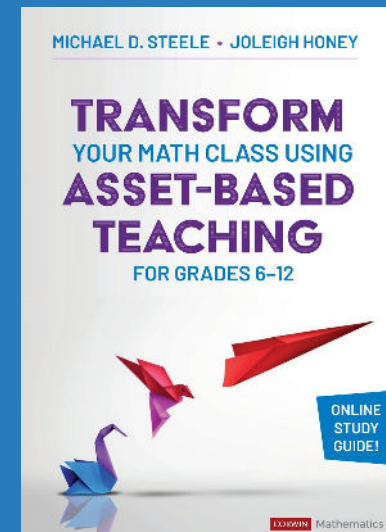


@joleighhoney



Joleighhoney@gmail.com

**New Hampshire
Math Learning Communities**
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About Me...



Author: Transform Your Math Class Using Asset-based Teaching in Grades 6 - 12



Pathways Consultant: Launch Years at the Dana Center



High School Curriculum Author: OpenUp Resources

Board of Directors:



National Council of Teachers of Mathematics



Conference Board of Mathematical Sciences

Past President, Association of State Supervisors of Mathematics

Learning Intentions



Our work together will focus on:

- Understanding asset-based perspectives
- Engaging in meaningful (grade level) mathematics
- Using asset-based routines, frameworks, and practices
- Celebrating our community and thinking about curriculum design



Success Criteria

New strategies and ways of being that result in:

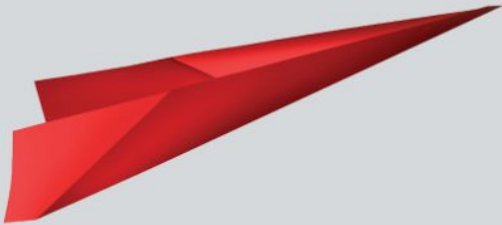
- Shifting our work further along the asset-based continuum
- Intentional implementation of curriculum, routines, framework, and practices that center students as owners of the mathematics they are learning
- Considerations regarding the Tier 1 and Tier 2 courses and deepening the community of learning via NH MLC

My motto for this work



“Do the best you can until you know better.
Then when you know better, do better.”

Maya Angelou



Asset-based Perspectives



Asset-based Perspectives



Start with

“What is”...



Asset-based Perspectives



Start with

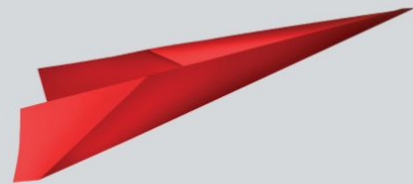
“What is”...

vs

“What is Not”



Asset-based Perspectives

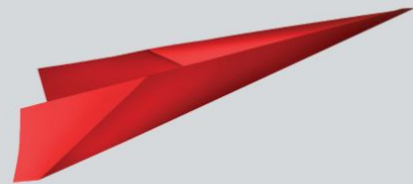


When we start with “What is”, we are more likely to...

- Increase the **sphere of belonging**
- Build on **student strengths**
- Hear **student thinking**: what students *do* know
- Promote a **positive mathematics identity***
- Provide **student choice**
- Recognize students as **capable**
- Actions showing we **believe** in others

... and so much more!

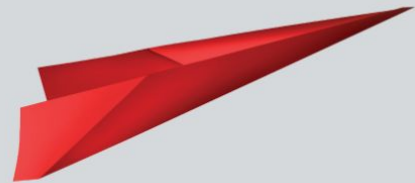
Asset-based Perspectives



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Asset-based Perspectives

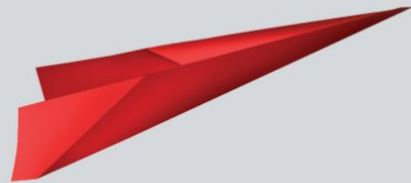


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... and so much more! Let's look at asset-based **language and routines**

Major Work of the Grade

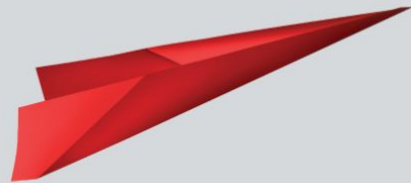


The purpose of this document is to provide a brief overview of the most essential content in the grade level along with a progression of how the content was addressed in the prior grade level and will prepare students for content in the future grade level. This is not a comprehensive list of content in the grade level as defined in the Utah Core Standards, but rather highlights the major work of the grade level.

Major Work of Grade Band: Grades 9 - 11

- Create, interpret, manipulate, and solve algebraic equations.
- Understand, compare, and represent functions (defined by rates of change, multiple representations and building functions)
- Describe characteristics of functions (definition of function, transformations, features of functions)
- Understand, apply, and prove congruence and similarity as defined in terms of geometric transformations

Major Work of the Grade



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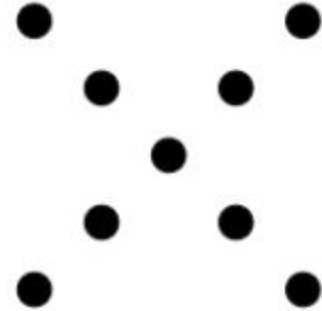
Let's look at a math task



At the
beginning



At one minute



At two minutes

Goals- Use and connect representations; Identify function type; contribute to the discussion and listen to the ideas of others

Let's look at a math task



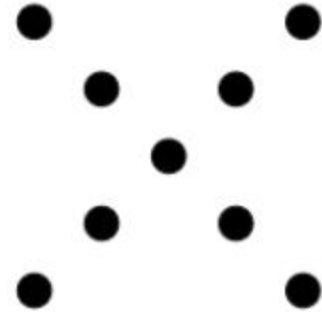
Launch



At the
beginning



At one minute



At two minutes

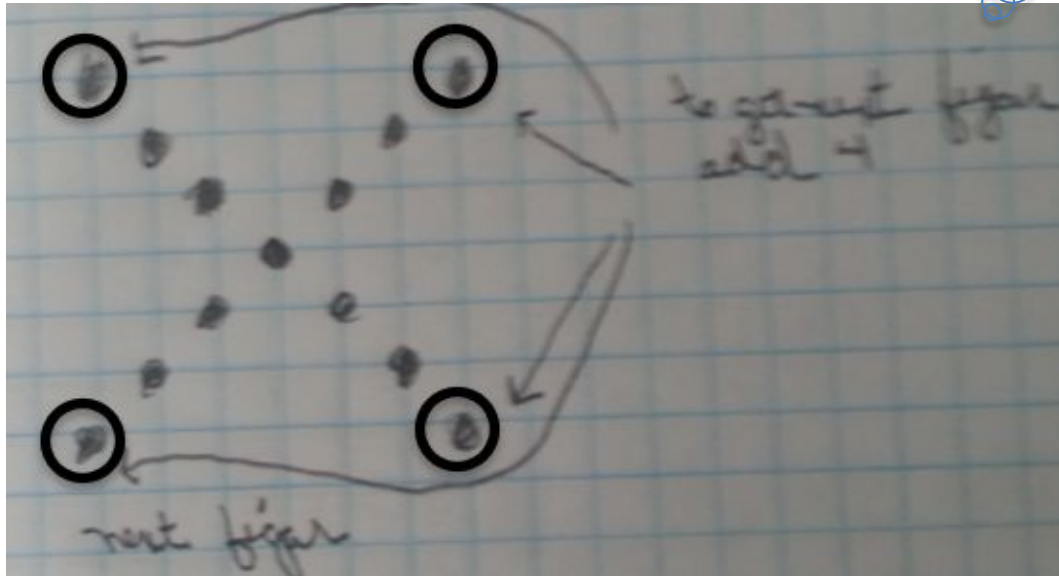
- How do you see the pattern grow?
- How would you draw the next figure that represents three minutes?
- Use multiple representations to show how the pattern grows over time.

Student Work Demonstrates Multiple Access Points

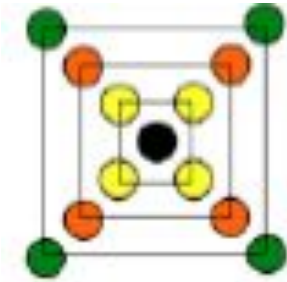


Explore Phase

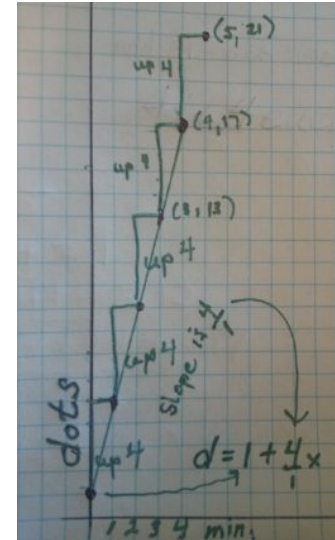
*"Just add 4
each time"*



Student Work Demonstrates Connections



time	# dots
0	1
1	5 $\uparrow +4$
2	9 $\uparrow +4$
3	13 $\uparrow +4$
4	17 $\uparrow +4$



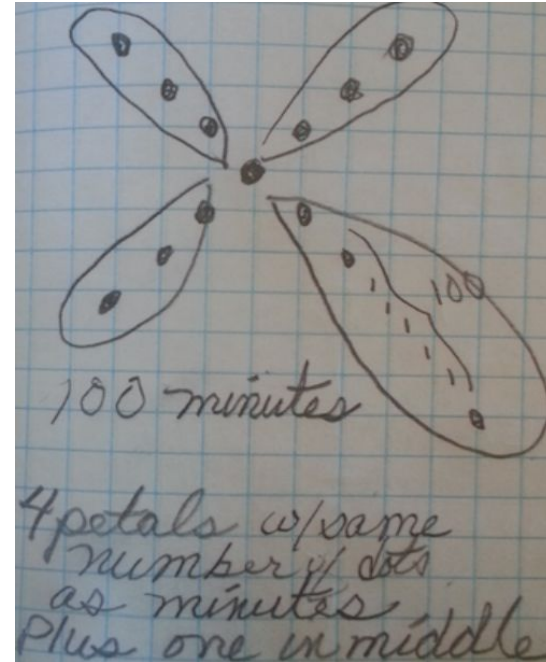
Explore to Discuss: Selecting, Sequencing

Student Work Demonstrates Connections

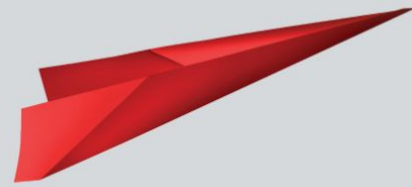


Explore and Discuss

MINUTE S (m)	NUMBER OF DOTS
0	1
1	$1 + 4 = 5$
2	$1 + 4 + 4 = 9$
3	$1 + 4 + 4 + 4 = 13$
4	$1 + 4 + 4 + 4 + 4 = 17$
5	$1 + 4 + 4 + 4 + 4 + 4 = 21$
6	$1 + 4 + 4 + 4 + 4 + 4 + 4 = 25$
7	$1 + 7(4) = 29$
8	$1 + 8(4) = 33$
9	$1 + 9(4) = 37$
10	$1 + 10(4) = 41$
100	$1 + 100(4) = 401$
M	$1 + M(4) = \text{DOTS}$
	$D = 4M + 1$



Asset-based Frameworks

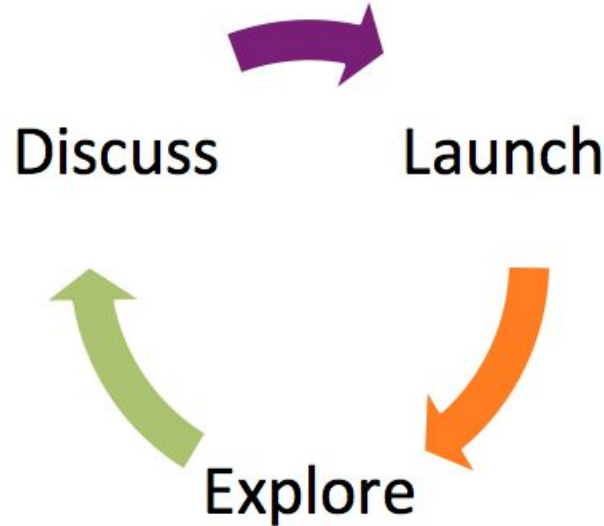


-
- Comprehensive Math Instruction Framework (Teaching Cycle and Learning Cycle)
 - Teaching for Robust Understanding (TRU) Framework
 - Universal Design for Learning (UDL) Framework and
 - UDL Math Framework
 - Social-Emotional Learning (SEL) Framework (CASEL Wheel)

Pedagogy- Teaching Cycle from CMI Framework



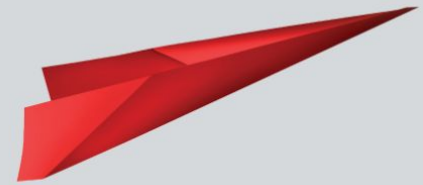
- Goals are evident through the use of students' voice and contributions.
- Student-to-student dialogue.
- Meaningful takeaways are realized by students.



- Context used to hook and motivate students.
- Prior knowledge is activated.
- Expectations for students are clear.

- Teacher monitors and prompts students with questions to guide their learning
- Teacher avoids undermining the opportunity for students to reason and solve problems.

Pedagogy: TRU Framework



EQUITABLE ACCESS TO CONTENT

The extent to which classroom activity structures invite and support the active engagement of all of the students in the classroom with the core disciplinary content being addressed by the class.

Classrooms in which a small number of students get most of the “air time” are not equitable, no matter how rich the content: all students need to be involved in meaningful ways.

<https://truframework.org/>

Pedagogy: UDL Math Framework

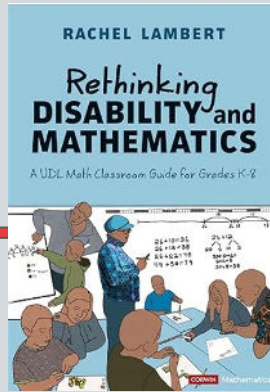


FIGURE 1.1 UDL Math Design Elements



SOURCE: Reprinted with permission from Lambert (2024).

Develop Core Ideas:

Does the design of the instruction guide student to understand...

Core mathematical ideas?

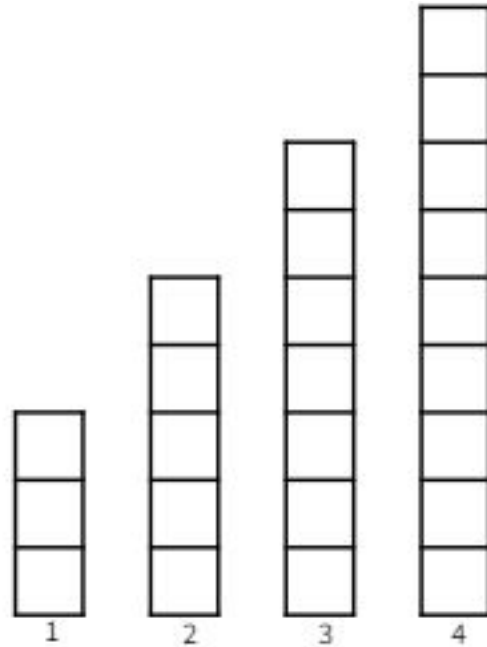
Mathematical representations?

Develop strategies?

Let's do some math!



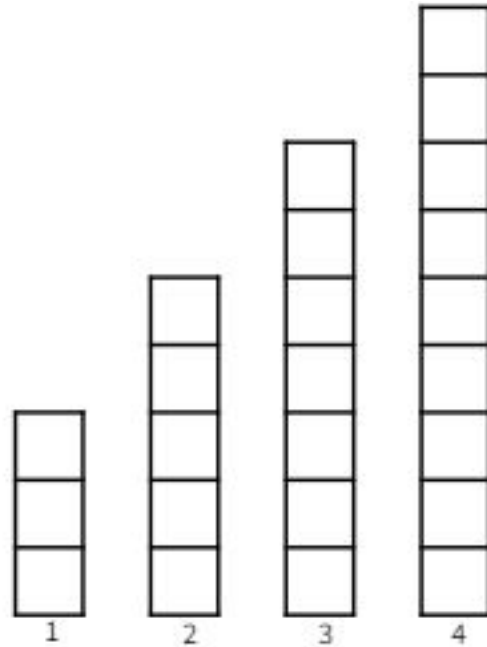
What do you **notice**?



Let's do some math!



What do you **wonder**?



Let's do some math!



In this particular situation, this data relates to exercise.

What are different examples of exercise?

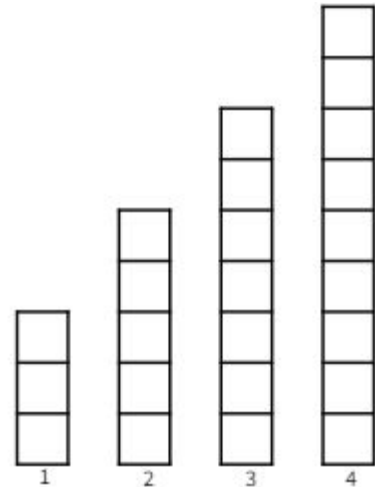


Let's do some math!



Scott has decided to add push-ups to his daily exercise routine. He is keeping track of the number of push-ups he completes each day in the given bar graph, with day 1 showing he completed 3 push-ups.

After four days, Scott is certain he can continue this pattern of increasing the number of push-ups he completes each day.



Lesson 4 ▶

Scott's Workout

Solidify Understanding

Let's do some math!



Model a sequence using a table, graph, and explicit and recursive equations.

How do I see the change between figures in each representation?

How can I tell if a sequence is arithmetic, geometric, or neither?

How are explicit equations different than recursive equations?

What are the advantages of using an explicit equation versus a recursive equation?

Assets



Reflect:

What assets existed in the task we just completed?

Implementation impacts continuum



Deficit-based

Asset-based

Asset-based:

- student choice
- independent think time
- partner share
- focus on strategy
- learn from peers
- seeing students as capable

Implementation impacts continuum



Deficit-based

Asset-based

Less Asset-based:

- no independent think time
- no indication of who shares first, second
- lack of student sharing and explaining strategy

Asset-based:

- student choice
- independent think time
- partner share
- focus on strategy
- learn from peer
- seeing students as capable

Which currently resonates for you?



If we use asset-based perspectives and:	Then we are more likely to:
Recognize “We all belong”	Increase the sphere of belonging
Leverage what is known	Utilize student thinking (vs focusing on what is not known)
Identify peer strengths	Build on strengths and provide choice
Promote a positive identity	Increase students seeing themselves and others as capable <i>doers</i> of mathematics
Provide choice	Recognize competence and value students ways of thinking
View others as capable	Value contributions and effort (think growth mindset)
Believe in others	Implement actions that cultivate a community of learning

More Frameworks...



UDL Math

SEL

Check these out... what do you notice?



Pedagogy: UDL Math Framework

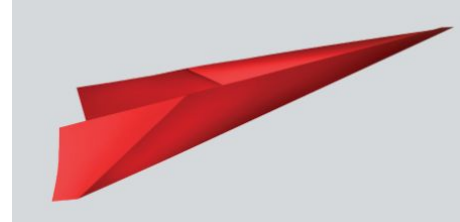
FIGURE 1.1 UDL Math Design Elements



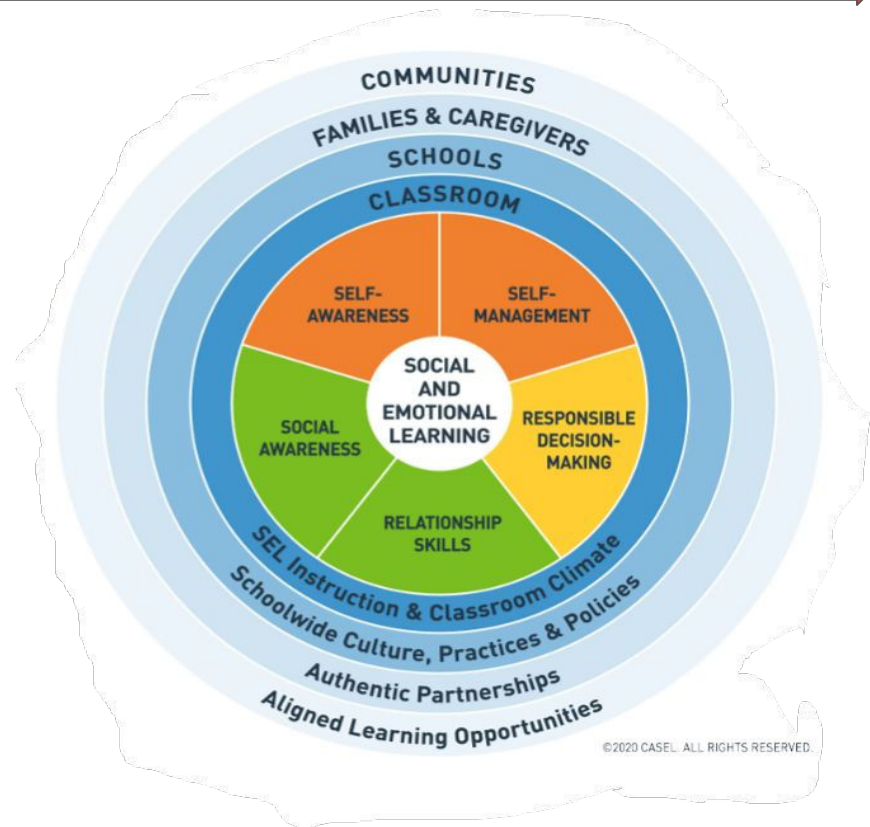
Multimodal
Student choice
Connected representations
Classroom Environment
Build relationships
Mathematical risks
Self as Learner

SOURCE: Reprinted with permission from Lambert (2024).

SEL Framework- Connected



- Social Awareness
- Relationship Skills
- Responsible Decision Making
- Self-Management
- Self-Awareness



Practices and Routines



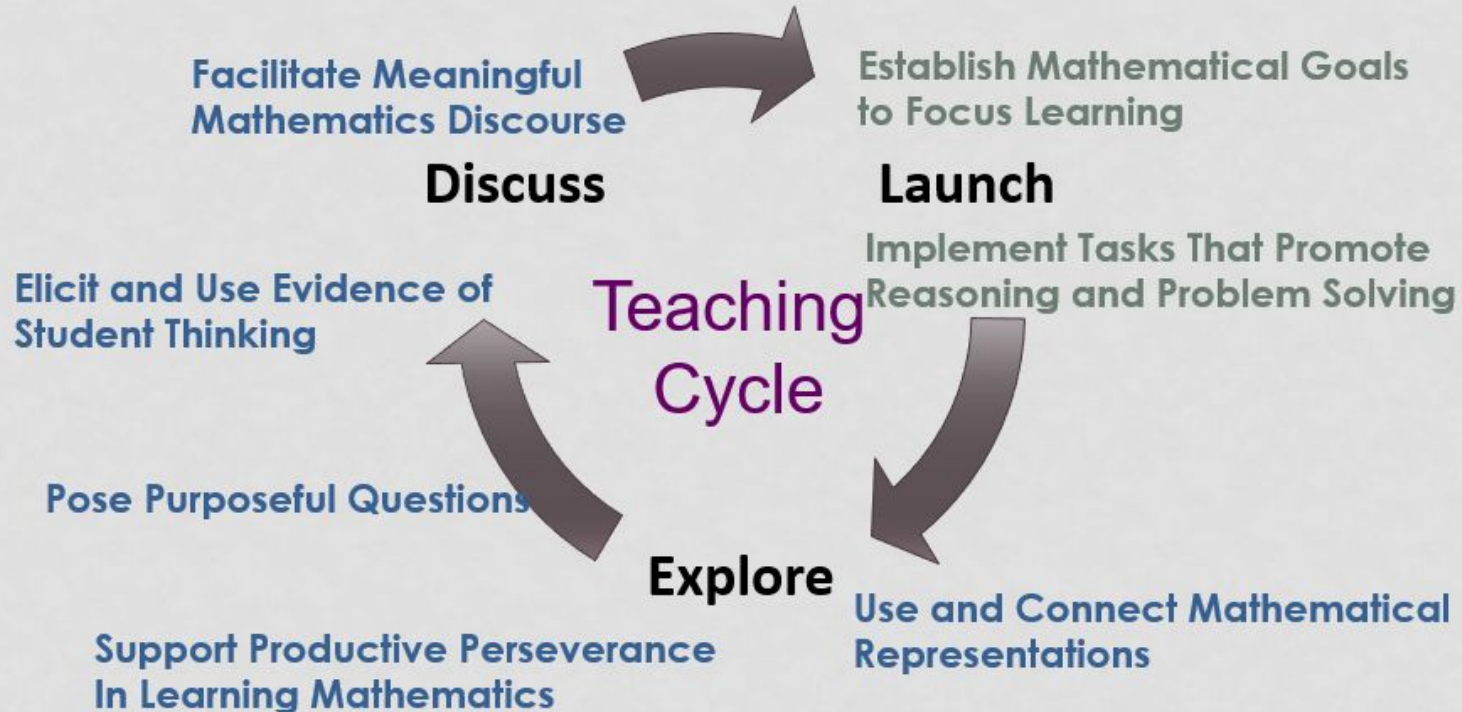
Practices:

- NCTM Teaching Practices
- Five Practices for Orchestrating Discussions

Routines:

- Think/Write-Pair-Share (TWPS)
- Notice and Wonder
- Which One Doesn't Belong?
- Math Language Routines

Pedagogy: NCTM Teaching Practices



Pedagogy: TRU Framework



AGENCY, AUTHORITY, IDENTITY

The extent which students are provided opportunities to “walk the walk and talk the talk” -

to contribute to conversations about disciplinary ideas, to build on others’ ideas and have others build on theirs -

in ways that contribute to their development of agency (the willingness to engage), their ownership over the content, and the development of positive identities as thinkers and learners.

<https://truframework.org/>

Identity



Having a positive mathematical identity means that people feel empowered by mathematics and as *doers* of mathematics see the multiple purposes for learning mathematics, appreciate why mathematics is important in their lives, and come to believe that they can succeed in mathematics. (p. 25)

NCTM Catalyzing Change, High School

2018

Getting Ready for a Pool Party!



Unit 3 Lesson 1

DEVELOP UNDERSTANDING

Lesson 1

Getting Ready for a Pool Party

Learning Focus

Graph a function to model a situation.

Interpret and identify key features of the graph.

How can we create a graph without equations or points being given?

How does a graph tell a story?

How do I describe key features of a graph?

Open Up the Math

Launch, Explore, Discuss

Sylvia has a small pool full of water that needs to be emptied and cleaned, then refilled for a pool party. During the process of getting the pool ready, Sylvia did all of the following activities, each

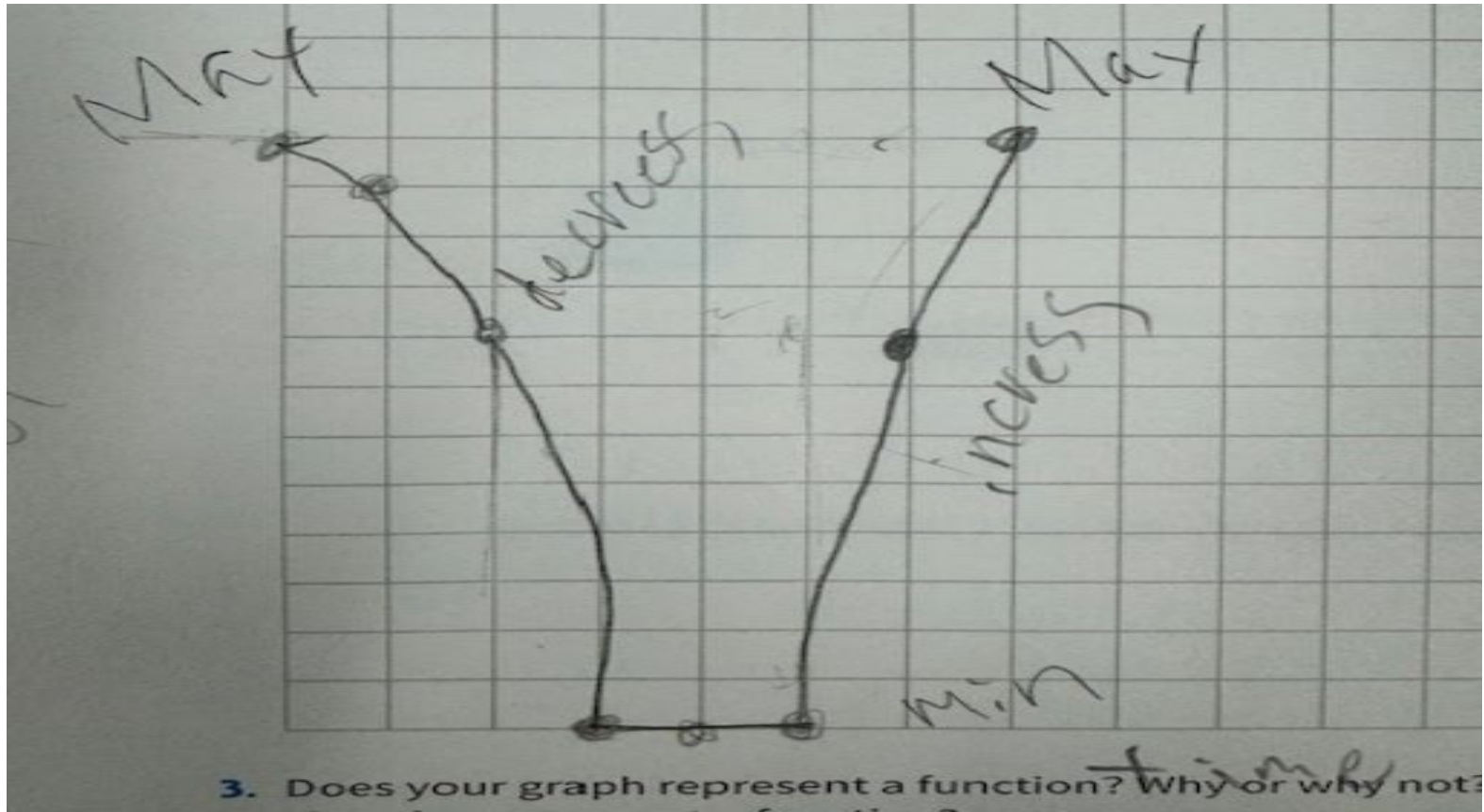
Getting Ready for a Pool Party!



Sylvia has a small pool full of water that needs to be emptied and cleaned, then refilled for a pool party. During the process of getting the pool ready, Sylvia did all of the following activities, each during a different time interval.

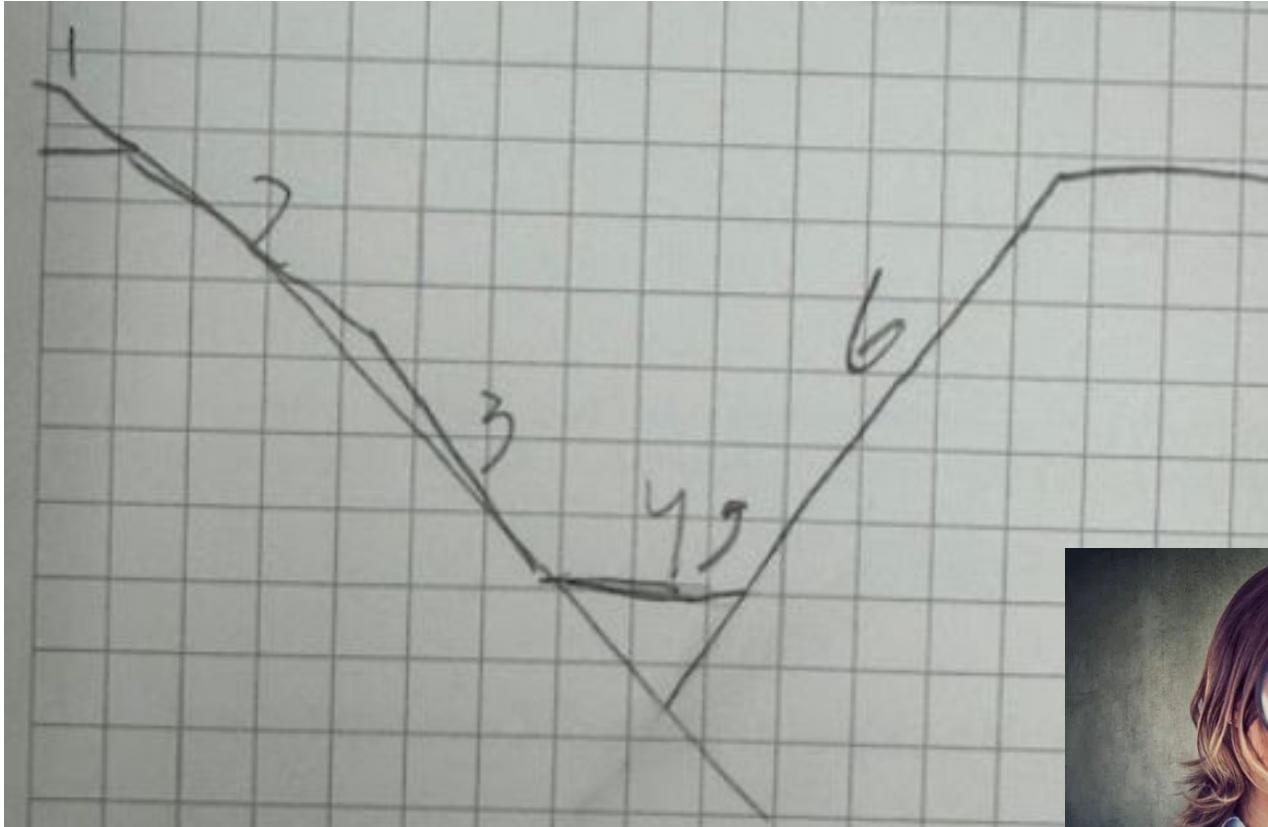
Removed water with a single bucket	Filled the pool with a hose (same rate as emptying pool)
Drained water with a hose (same rate as filling pool)	Cleaned the empty pool
Sylvia and her two friends removed water with her three buckets	Took a break

Getting Ready for a Pool Party!

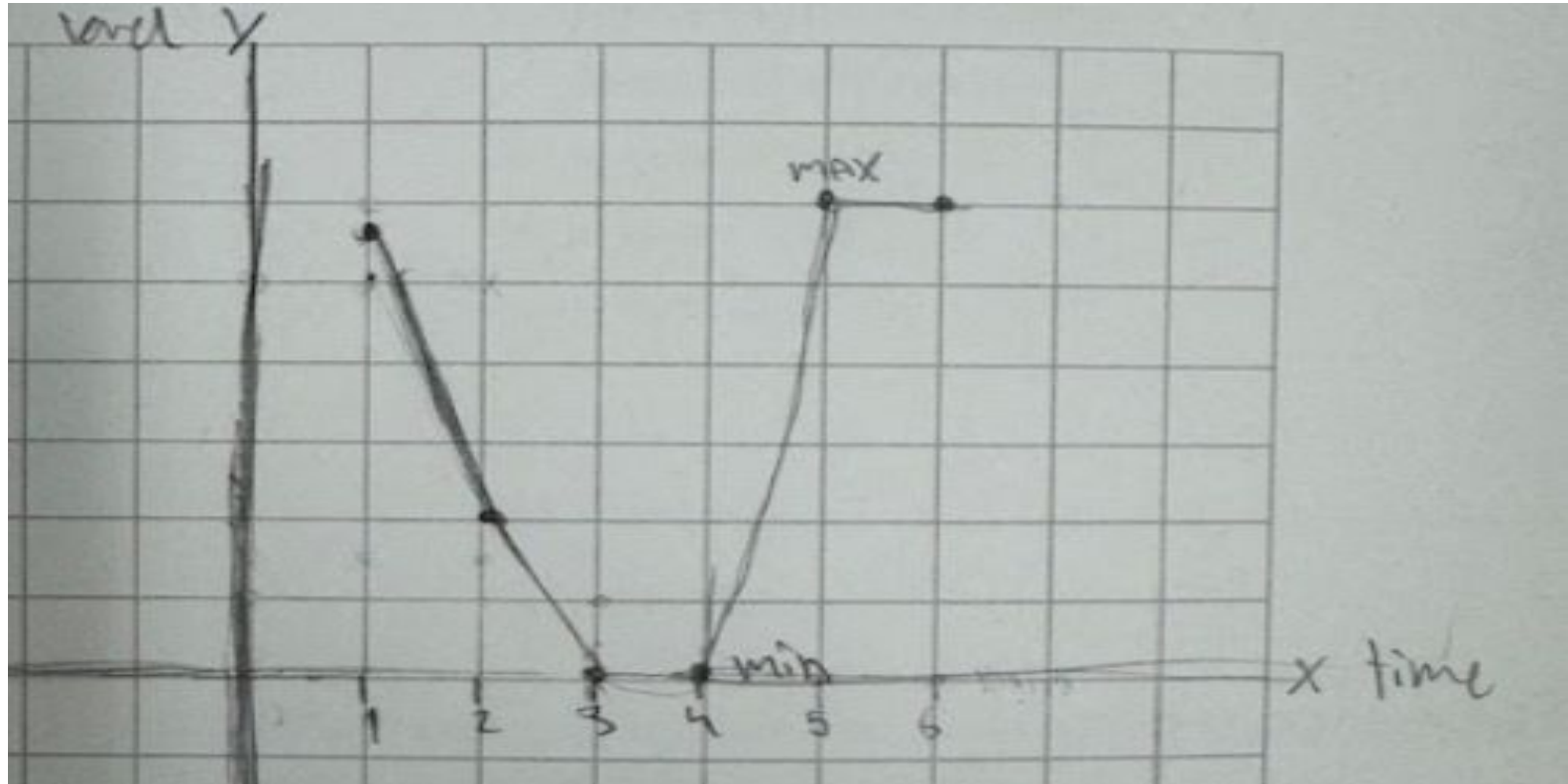


3. Does your graph represent a function? Why or why not?

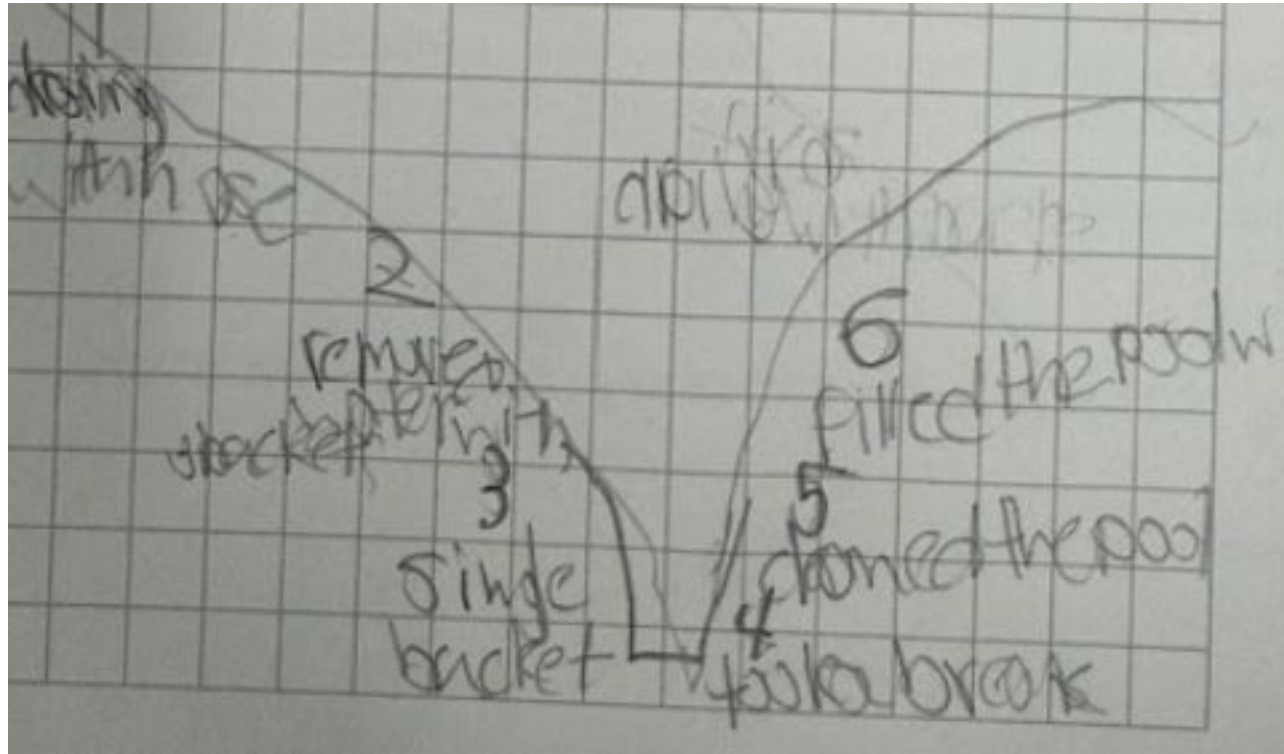
Getting Ready for a Pool Party!



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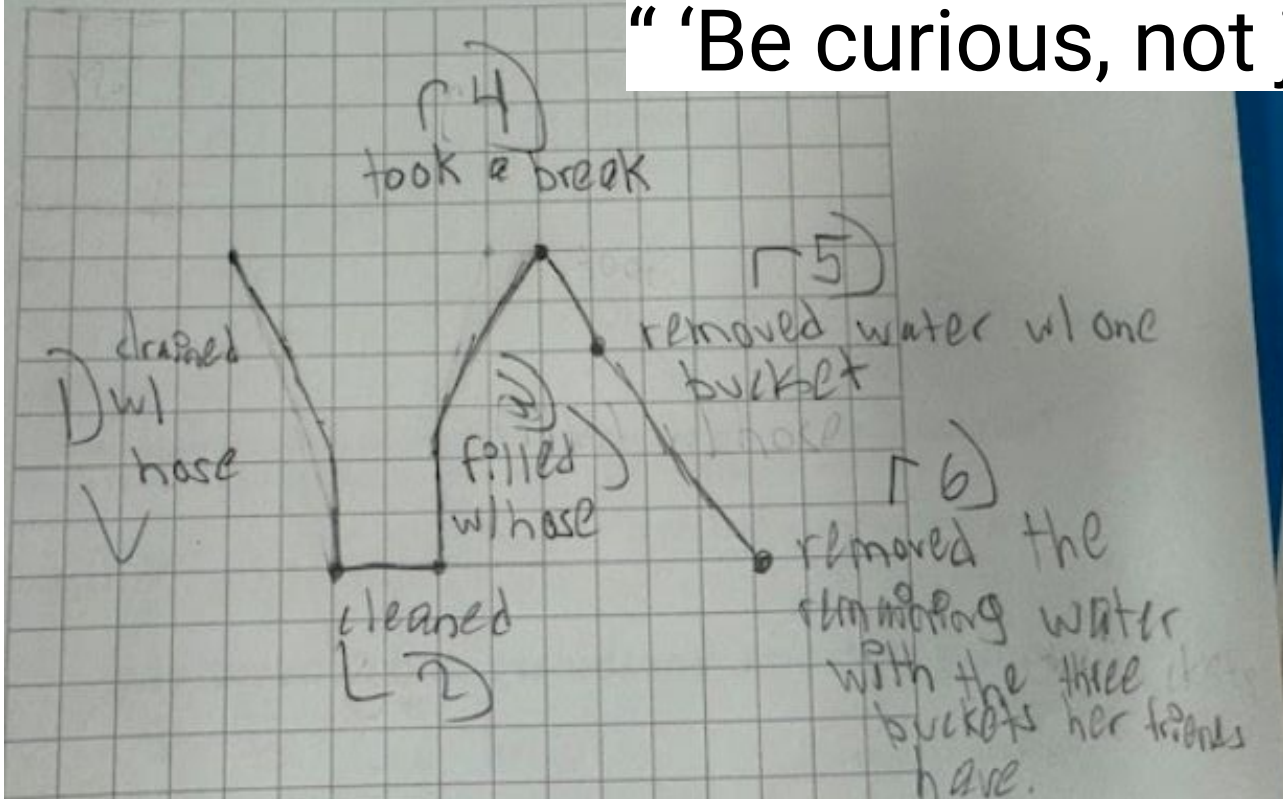
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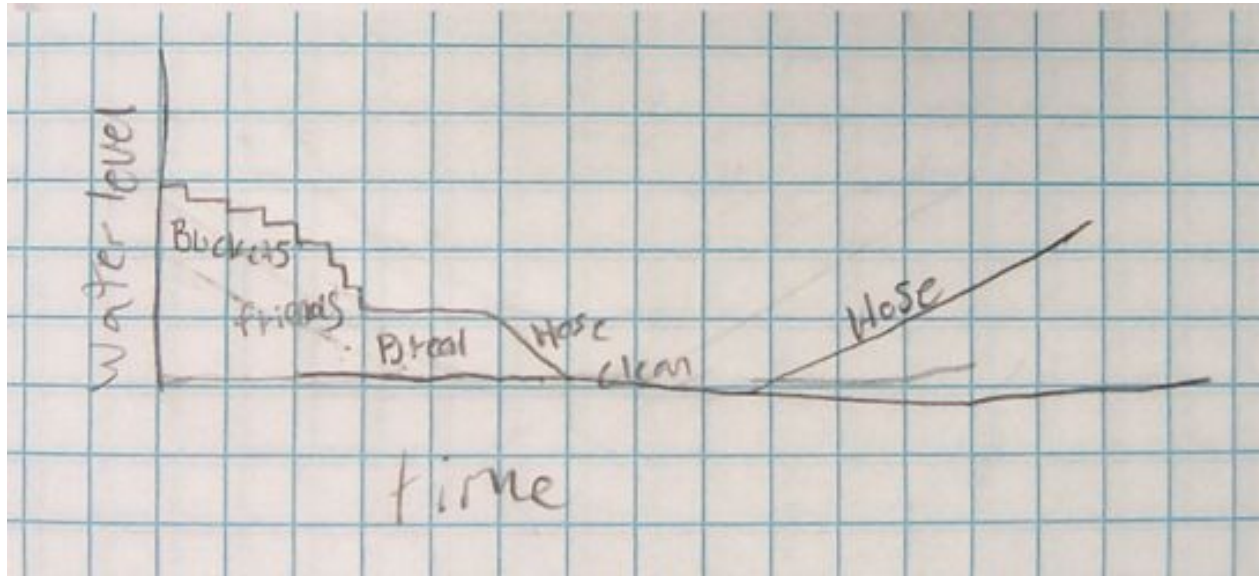


labeling where each activity occurs.



“Be curious, not judgmental.”

Getting Ready for a Pool Party!



TIP:

Language-- don't let perfection prevent us from focusing on what is right about student thinking, and how that thinking aligns with our goals.

Curriculum Design



Let's Do This! Create new spaces that

- Provide students a break from traditional methodology
- Create a shift in concepts and how they are introduced
 - Less algorithmic
 - More connections between math concepts
 - Stronger relevance for students
- Promote strong networking and community opportunities for educators



Straight roads do not make skillful drivers

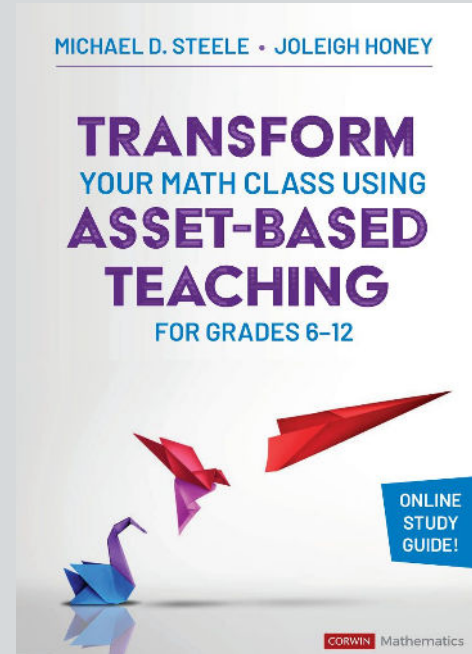
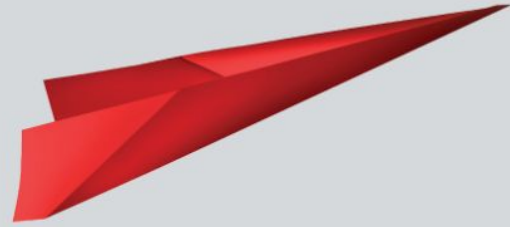


Paolo Coehlo



UCTM Pool Party

What are your takeaways?



Close the Gap!

TAKEAWAYS:

- Know the **major grade-band concepts**.
- **Start instruction** with a focus on the **most important grade level content**. Provide just in time supports as needed.
- **Create curriculum that promotes asset-based perspectives**
- **Implement tasks** that provide **multiple entry points** and provide multiple opportunities, over time.
- **Equitable access** to content.
- Use **asset-based instructional routines** that promote learner **identity and agency**.