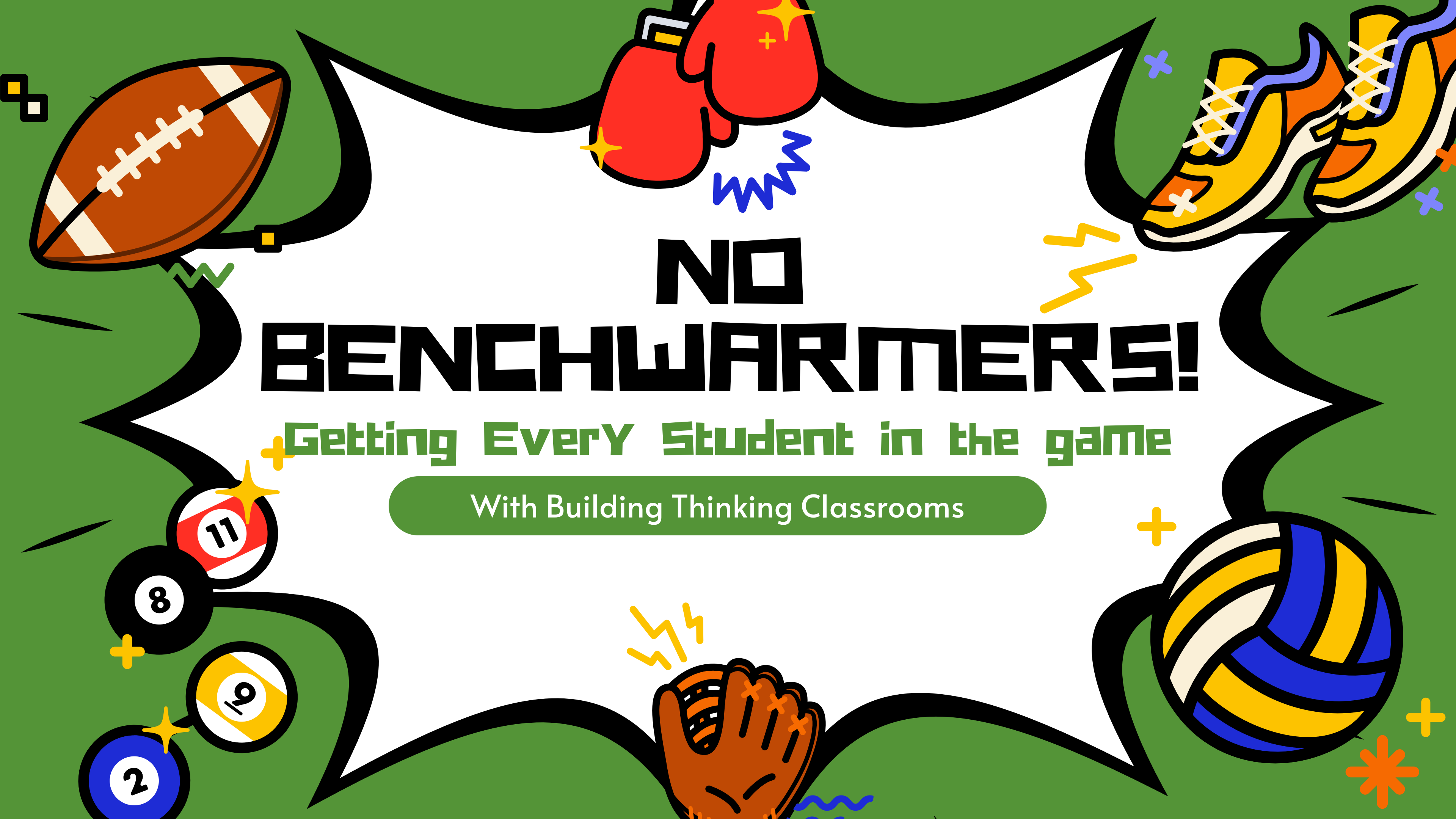
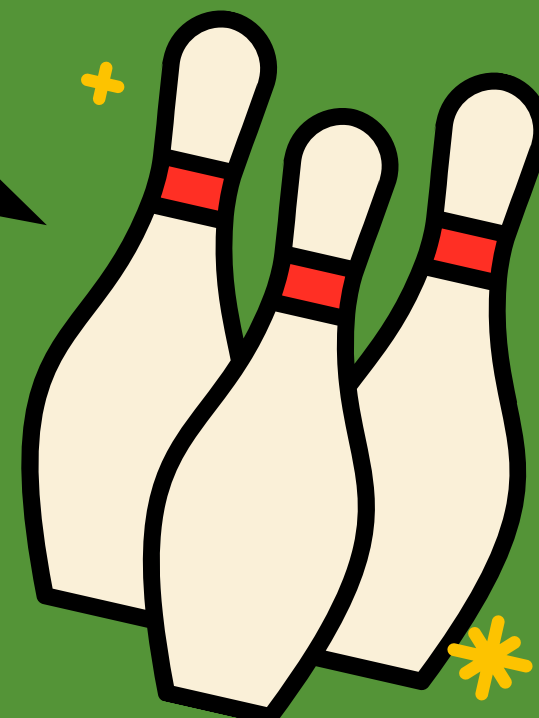




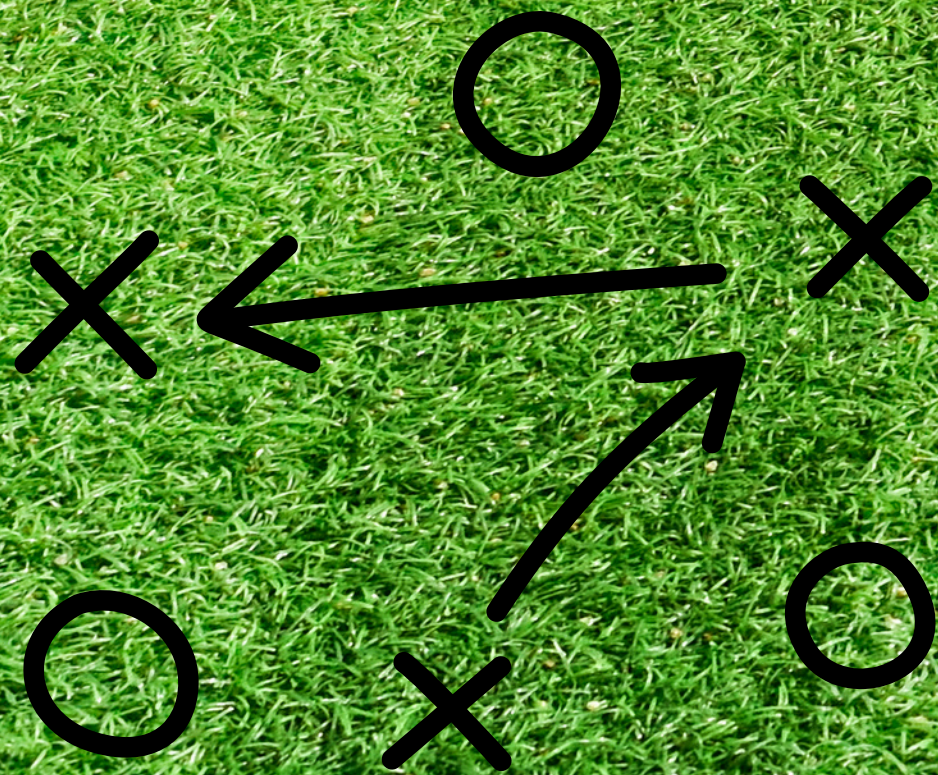
NO BENCHWARMERS!

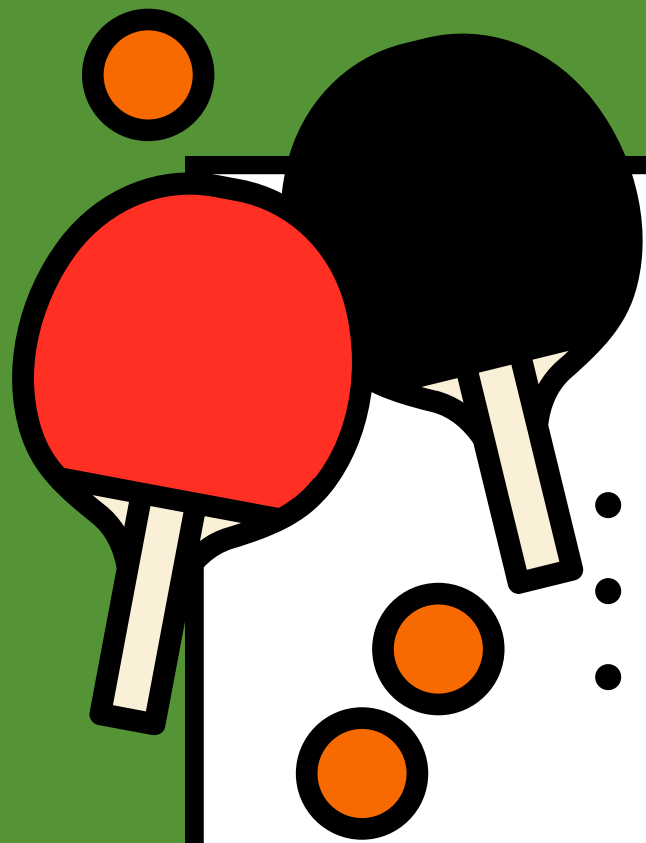
+ Getting Every Student in the game

With Building Thinking Classrooms



To receive credit for this session, make sure you complete the survey at the end





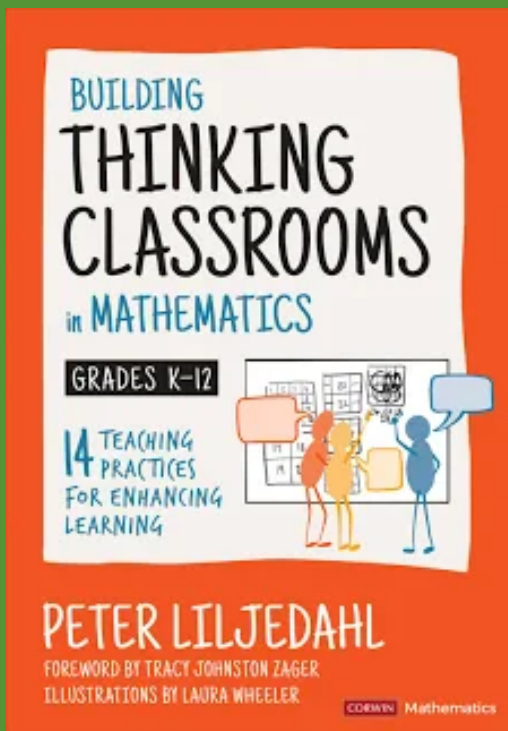
Carla Dalton

- Secondary Math Instructional Coach
- 23 years in education
- 4 years (off and on) using BTC strategies



Jennifer Covert

- Algebra I Teacher (Tidwell, moving to Byron)
- 20 years in education
- 3 years using BTC strategies



WHY BTC?

“Thinking is a necessary precursor to learning,
and if students are not thinking, they are not
learning.”
-Peter Liljedahl



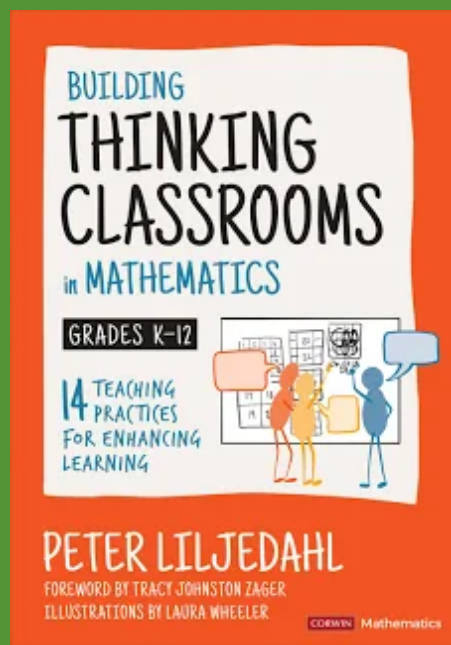
TWO QUESTIONS

Are students
thinking or just
completing
activities?



Do we plan lessons
based on the
assumption that
students can't or
won't think?





Slacking

didn't even try the tasks,
literally did nothing

Stalling

found ways to avoid the task
(sharpen pencil, get a drink...)



Faking

pretending to look at the work,
flipping pages

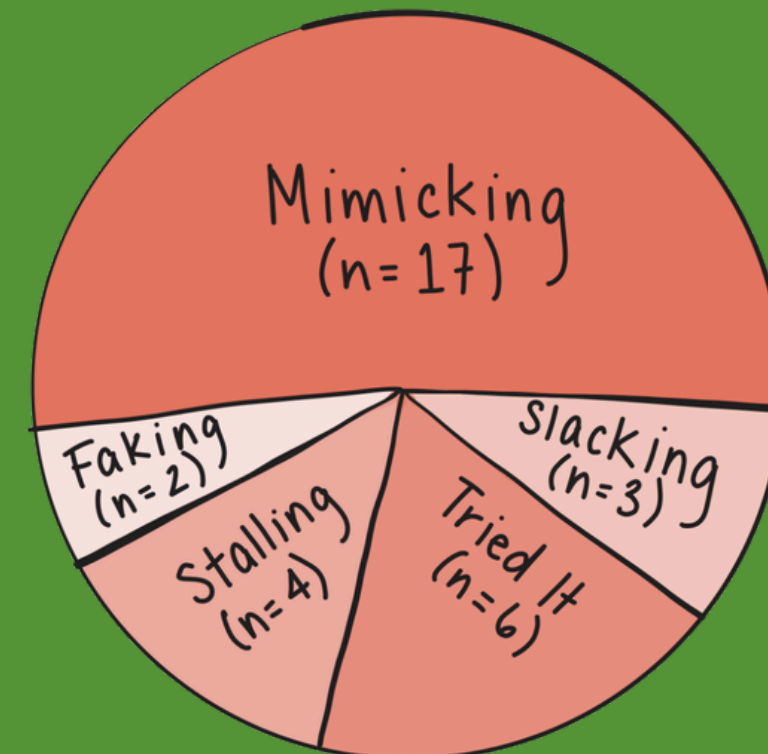
What Liljedal Saw

Mimicking

attempted the tasks by recreating
the pattern of the solutions that
were just shared

Trying it on their own

checking their understanding and
getting feedback as was intended



32 students=
Distribution of
studenting
behaviors on now-
you-try-one tasks

- Give thinking tasks
- Frequently form visibly random groups
- Use vertical non-permanent surfaces

- Defront the classroom
- Answer only key

- thinking questions
- Give thinking task early, standing, and verbally
- Give check-your-understanding questions
- Mobilize knowledge

- Asynchronously use hints and extensions to maintain flow
- Consolidate from the bottom
- Have students write meaningful notes

- Evaluate what you value
- Help students see where they are and where they are going
- Grade based on data (not points)

Chapters 1-3
Toolkit #1

Focuses on Student Behavior

Toolkit #1

- Give thinking tasks
- Frequently form visibly random groups
- Use vertical non-permanent surfaces



Random Grouping is KEY

When teachers or students determine groups

The percent of students that enter their group feeling like they were going to be a follower rather than a leader - a follower NOT a thinker!

Public share Grouping Cards

Flippity Random Name Generator

Team Picker Wheel

Random grouping WILL work!

- When behavior issues happen, go back to the group work rubric in Chapter 12
- Student Daily Reflection Rubric Examples



Name _____ # _____ Date _____

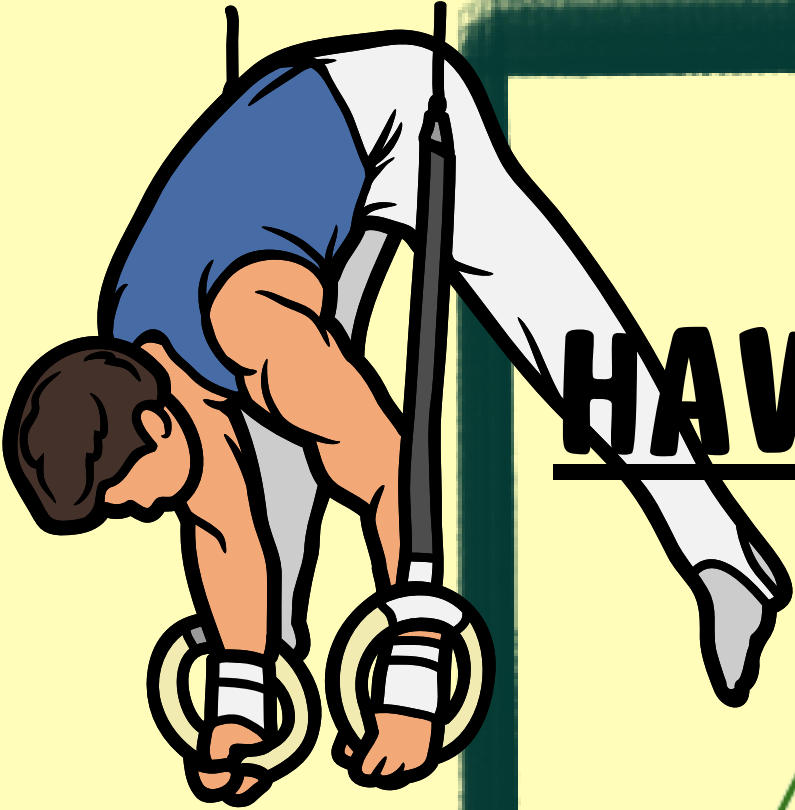
Team Members: _____

Not Yet	Getting There	Got it!
---------	---------------	---------

Reflections on Collaboration, Work Habits, & Perseverance

Working alone	Working together
Not trying and/or giving up	Not giving up when it gets tough
Goofing off	Focused and on track with the task
Disruptive behavior (voice level, stay with group, appropriate language)	Appropriate small group behavior

What do I need to work on next time?



HAVE CLEAR WHITEBOARD EXPECTATIONS

RANDOM GROUPS

Stand with your group at your whiteboard.



RECORD the TASK

Listen carefully to the task. Record key information at the top of your whiteboard.



ONE MARKER

The person explaining their thinking should be different than the person writing. Take turns.

ERASE with CARE

Ask permission to erase someone else's ideas. Don't erase work circled by the teacher.

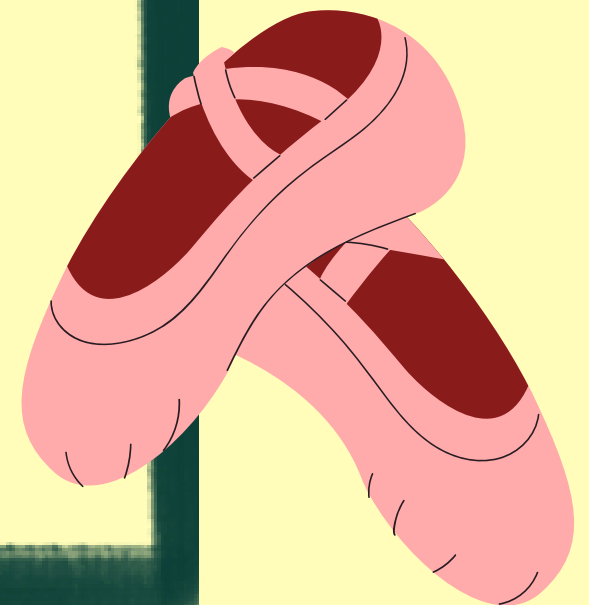


WORK TOGETHER

Be responsible for the learning of every member. **EVERYONE** in your group must understand so that **ANYONE** can explain.

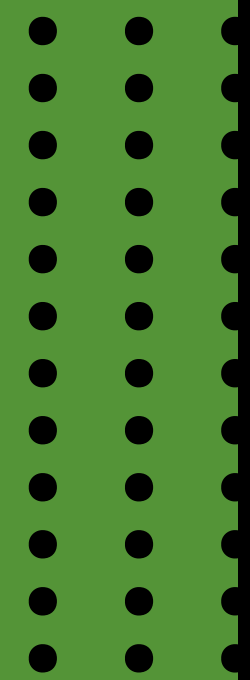
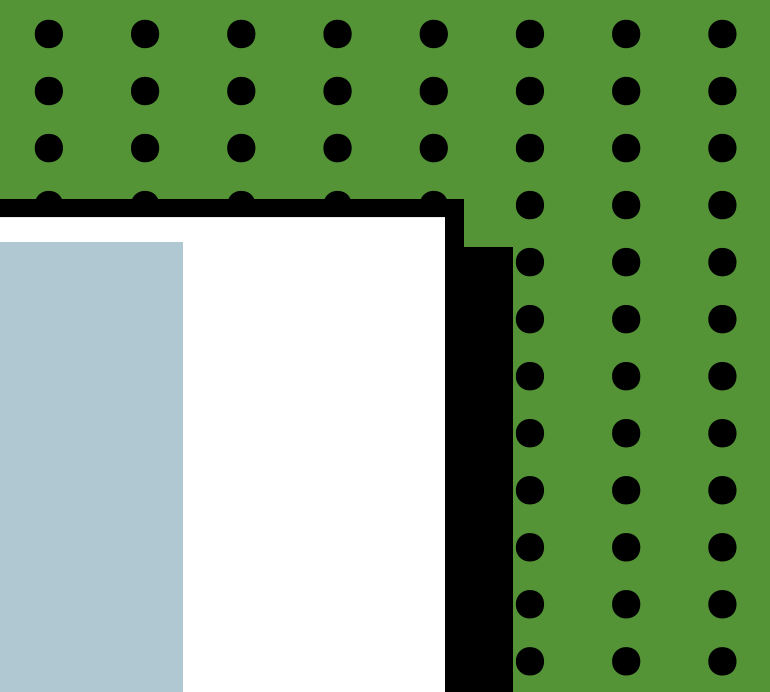


Remember, "wrong" thinking can lead to new ideas!





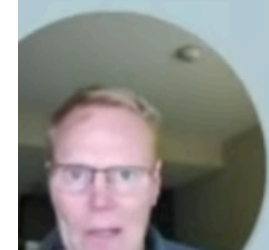
Whiteboard Structures For Your Thinking Classroom



②
PETER (W)
KYLE (P)
MAGGIE (P)

$3x + 2 = 14$

PETER (W)
KYLE (P)
MAGGIE (P)



Video Link



BUILDING THINKING CLASSROOMS®

- Give thinking tasks
- Frequently form visibly random groups
- Use vertical non-permanent surfaces

- Defront the classroom
- Answer only keep thinking questions
- Give thinking task early, standing, and verbally
- Give check-your-understanding questions
- Mobilize knowledge

- and extensions to maintain flow
- Consolidate from the bottom
- Have students write meaningful notes

- Evaluate what you value
- Help students see where they are and where they are going
- Grade based on data (not points)

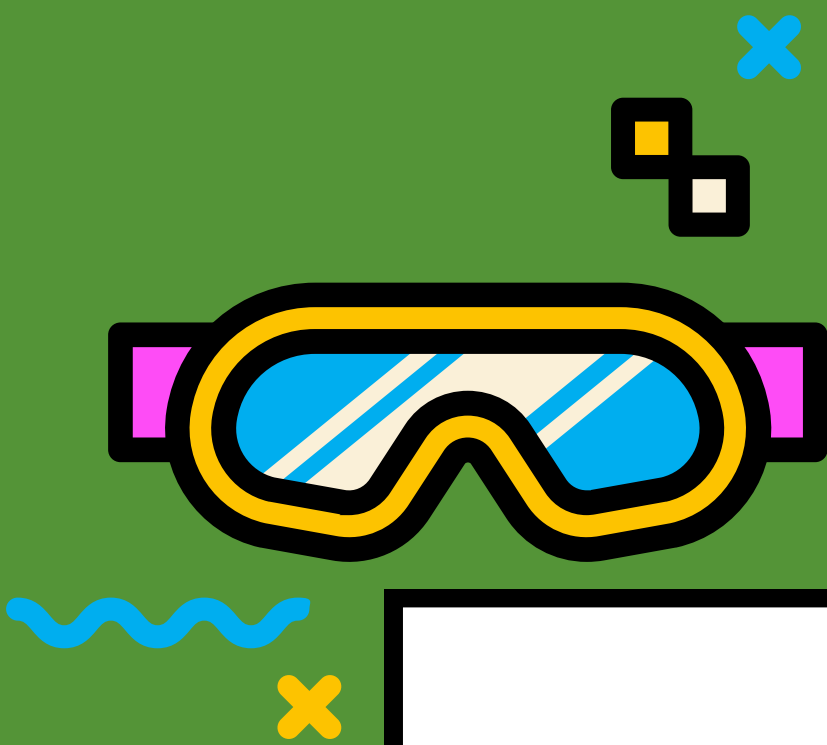
Toolkit #2

Chapters 4-8

Toolkit #2

Focuses on Teaching Practices that create community

- Defront the classroom
- Answer only keep thinking questions
- Give thinking task early, standing, and verbally
- Give check-your-understanding questions
- Mobilize knowledge



Facilitating Instruction:

- Use the Learning Target to introduce vocab & review prior learning.
- Review board expectations with students
- Send them off to learn!





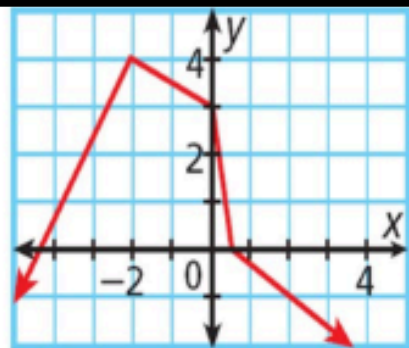
Thin Slicing:

- Scaffold questions at the boards
- Feel free to mix up the “rules”
 - Give problems one at a time in strips (mild, medium, spicy)
 - Reveal problems on a “ribbon” at the top of the boards.
 - Give problems all at once in increasing level of difficulty
- Prep for PLENTY of problems so no group thinks they are ever finished.
- NO ERASING (until you permit)





Thin Slicing:



$$f(-2) = 4$$

$$f(0) = 3$$

$$f(-1) = 3.5$$

$$f(2) = -1$$

- What do you notice?
- What connections can you make between the graph & information given?
- What conclusions can you draw about the notation?
- When finished with graph, choose from the folders...work at least one mild, med, & spicy

(mild)

If $f(x) = x-5$, then....

$$f(1) =$$

$$f(-1) =$$

$$f(0) =$$

(medium)

If $f(x) = 2x+5$, then...

$$f(0) =$$

$$f(5) =$$

$$f(-3) =$$

(spicy)

If $g(x) = x^2 - 3$, then....

$$g(0) =$$

$$g(1) =$$

$$g(-1) =$$

(guac...because it's extra)

If $f(x) = x+2$ and $g(x) = 2(x-1)$, then...

$$g(f(x)) =$$

$$f(g(x)) =$$



Questions that Foster Student Autonomy

Questions that Support Productive Struggle and Foster Student Autonomy

Listen for student thinking -----> Ask Questions

Check for Accuracy (You KNOW the student understands the topic)

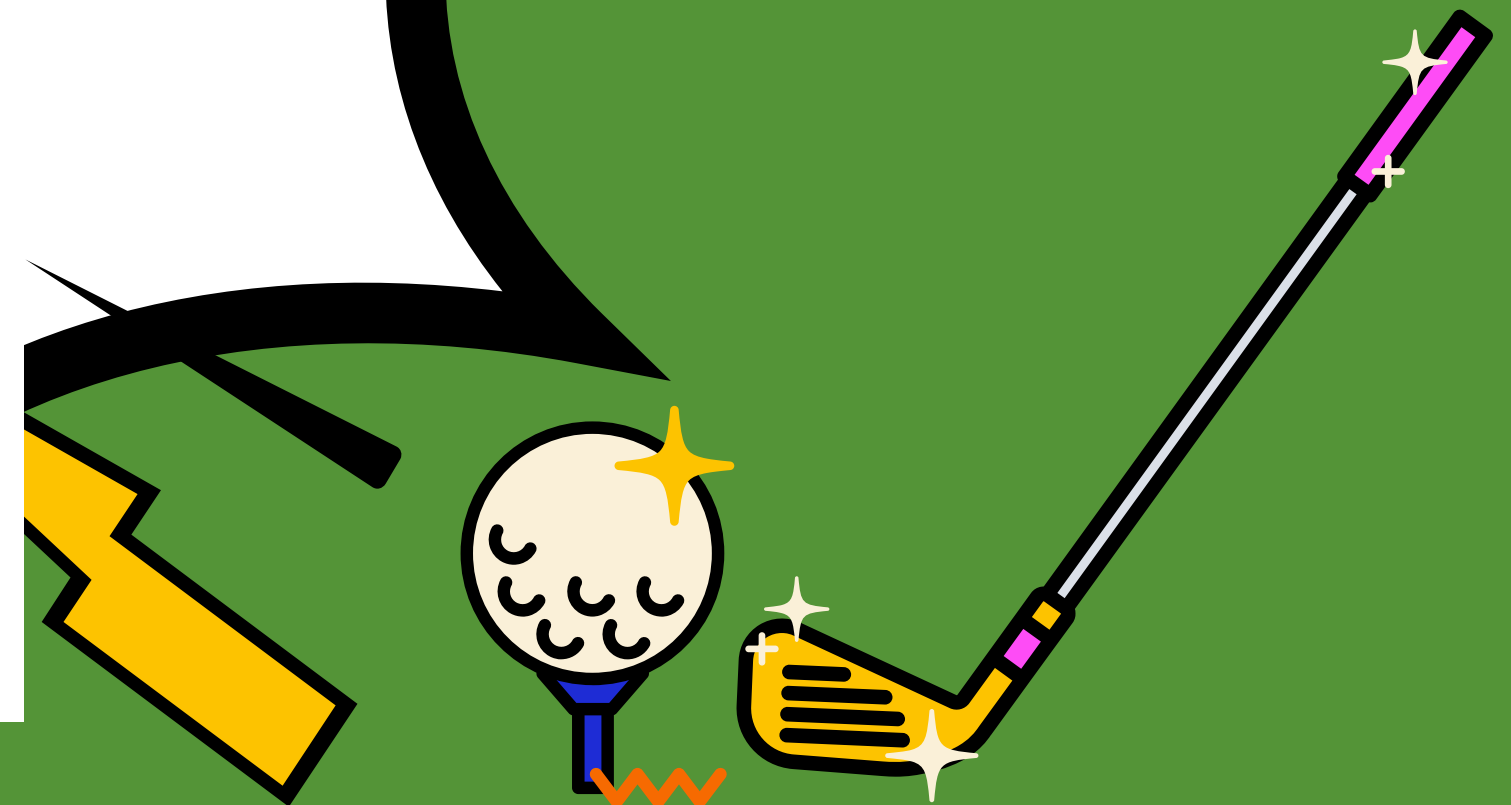
1. Explain your method or strategy you used - Why did you choose that method?
2. Would it work if you didn't use that method?
3. If you broke this down into parts, what would they be?
4. Can you create and solve a problem similar to this one?
5. Try doing this a different way to show your thinking.
6. Can you think of a nonexample?
7. If another student were confused about this, how would you explain it?

Check for Understanding (You THINK a student understands the topic)

1. Why did your method work?
2. How do you know your answer is correct?
3. Can you convince me you are correct?
4. Have you thought about all parts of your answer?
5. Can you explain your thinking in simpler terms?
6. Can you make a model to show that?
7. If another student were confused about this, how would you explain it?

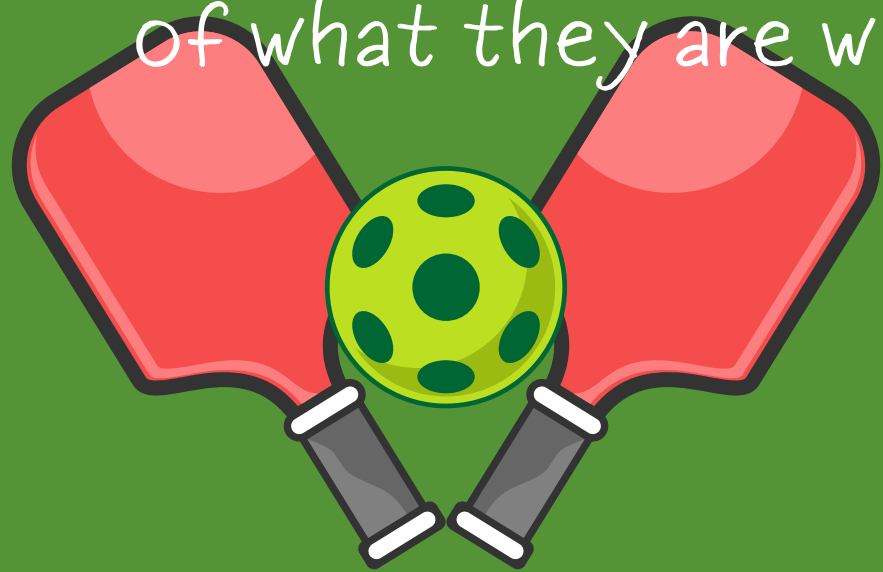
Check for Clarity (You THINK the student may be confused)

1. What do you need to find out?
2. What do you already know?
3. What strategies could you use?
4. Could a model or manipulatives help us solve this?
5. How would you describe the problem in your own words?
6. What did other members of your group try?
7. If you did know how to solve this problem, how would you start?



Consolidation & Note-Taking

“With direct teaching, this continual effort to track, write, and keep up with the teachers’ thinking requires a huge amount of cognitive effort, which causes students to fall further behind - to the point where they just stop listening and trying to make sense of what they are writing.”



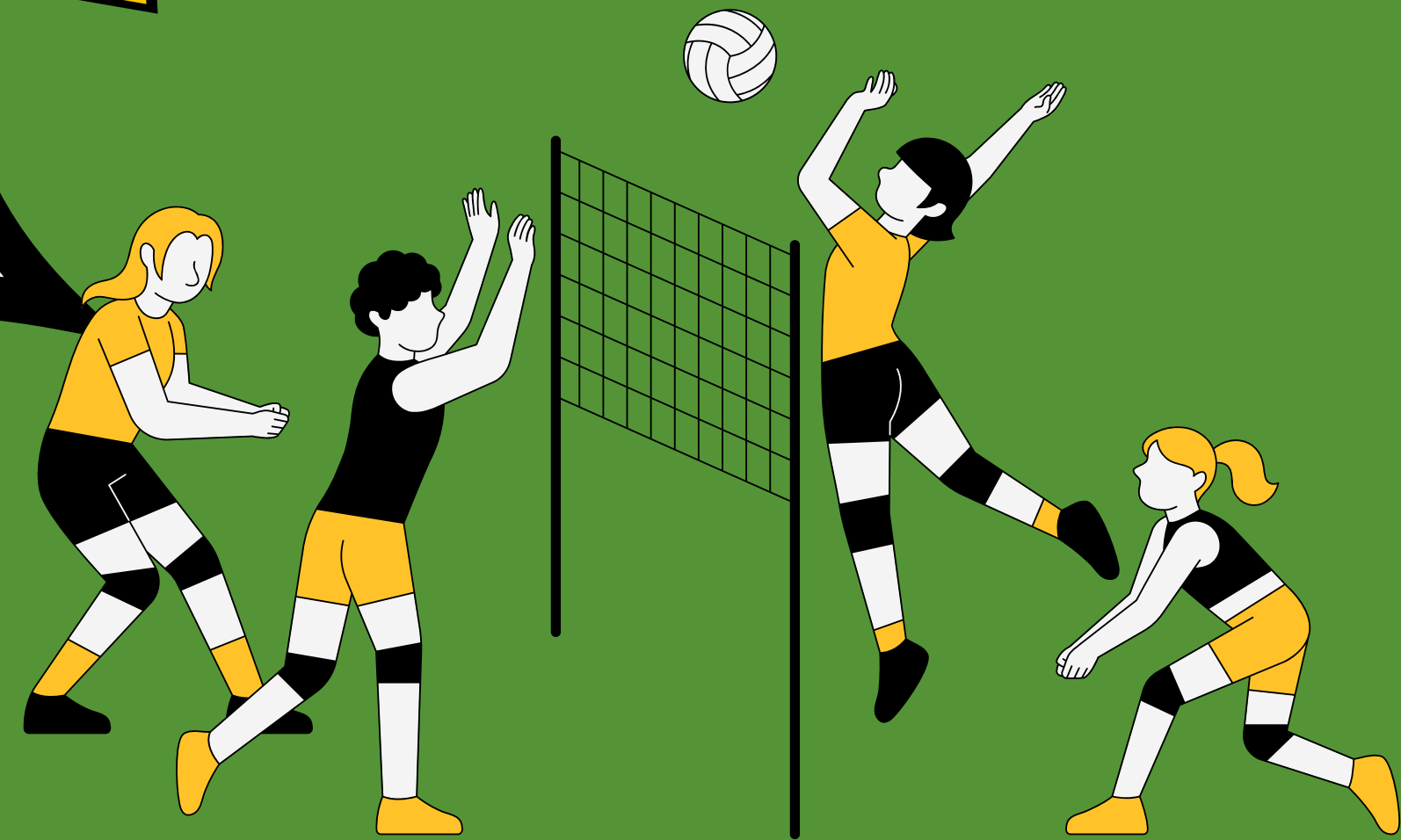
NOTES TO SELF Unit 2 : Functions & Models Lesson: ____ Function Notation ____	
Learning Target: _____	
 Vocabulary: Function notation- x f(x) Domain: Range:	 Big Ideas/Concept: Big Ideas
 Procedures: How do I use what I learned today?	 Examples: Examples $f(x)=2x-1$ $f(0)$ $f(x)=5, x=$
 Forgetful Self: What do I need to make sure NOT to forget?	$g(x)=x^2+1$ $g(-2)$

Instead, with BTC, notes are student-driven and at the end

- Similar to closing a lesson in workshop model.
- Summarizing the learning
- Connecting previous learning to current learning
- Discuss a specific example problem used to ensure collective understanding
- Could be done at the boards (whole group discussion) or projected on the TV
- Should have journals to document understanding

Make Time for Play

- Even 5-10 minutes a day of boardwork or movement can change your classroom.
- Put “Play Time” on your calendar!



CURRICULAR THINKING TASKS IN SAVVAS



Math Walk Video Generate excitement about the topic by having students watch the Math Walk video.

Question in the Video

Q: How long can they wait for the bus without being late?

As students watch and listen to the multimedia Math Walk video, encourage them to derive the meaning of interval to begin to build concepts related to inequalities and absolute value equations.

Questions for Students

You might give students copies of the Math Walk questions or just project them and have students turn and talk to a partner followed by whole-class discussion.

- What did you notice?
- What did you wonder?
- What question in the video is the person trying to answer?

EXPLORE & SHARE

Cindy and Victor are playing a math game. The winner must get three in a row of the same type of real number and justify how the numbers are alike. Cindy said she won because she was able to get three rational numbers on a diagonal. Victor said he won with three positive numbers in a column.



A. Can both players say they won for different reasons? Explain.



WHO CAME TO WIN TODAY?



[HTTPS://TINYURL.COM/BTCBENCH](https://tinyurl.com/btcbench)



WANT ATTENDANCE CREDIT?

To receive attendance credit for all sessions, you **must fill** out the feedback form after each session. You can get to the feedback form by using the tinyurl below or scanning the QR code. Please do so within 30 minutes of the session ending. You will receive a copy of your response, so you can make sure you did your survey and to check attendance. **Save this for your records!**

<https://tinyurl.com/ENGAGE26FB>

SCAN HERE

