

LOOK WHO'S TALKING TOO! USING STRUCTURED INTERACTIONS TO DEEPEN STUDENT COLLABORATION AND DISCOURSE

NCTM Conference San Diego

Convention Center Room 31AB

Saturday, April 6, 2019 8:00 am



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You
have
written
the best
lesson
ever!



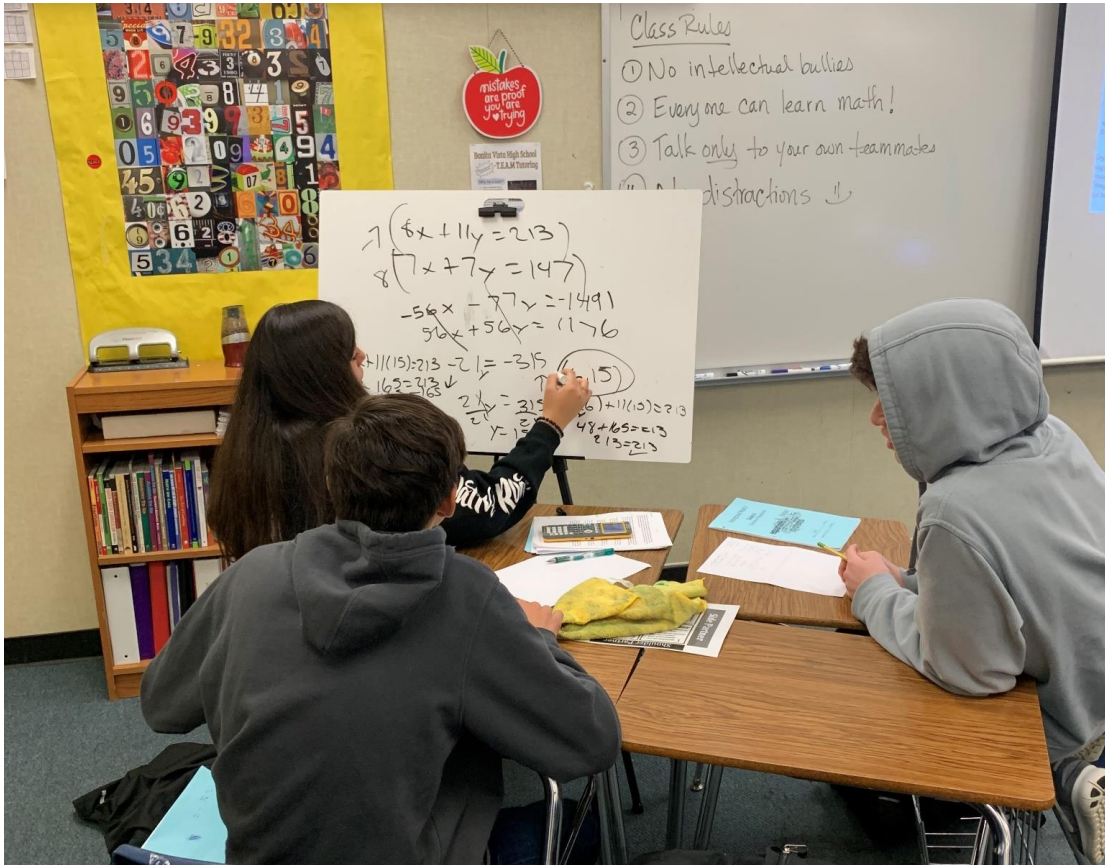
You selected
the best task
for the lesson.



You spent extra time
developing the task
into an engaging
exploration for your
diverse students.



You have invested
time building
relationships with
your students and
their families.



How do you make sure
EVERY student has a
voice?

So that **EVERY**
student will:

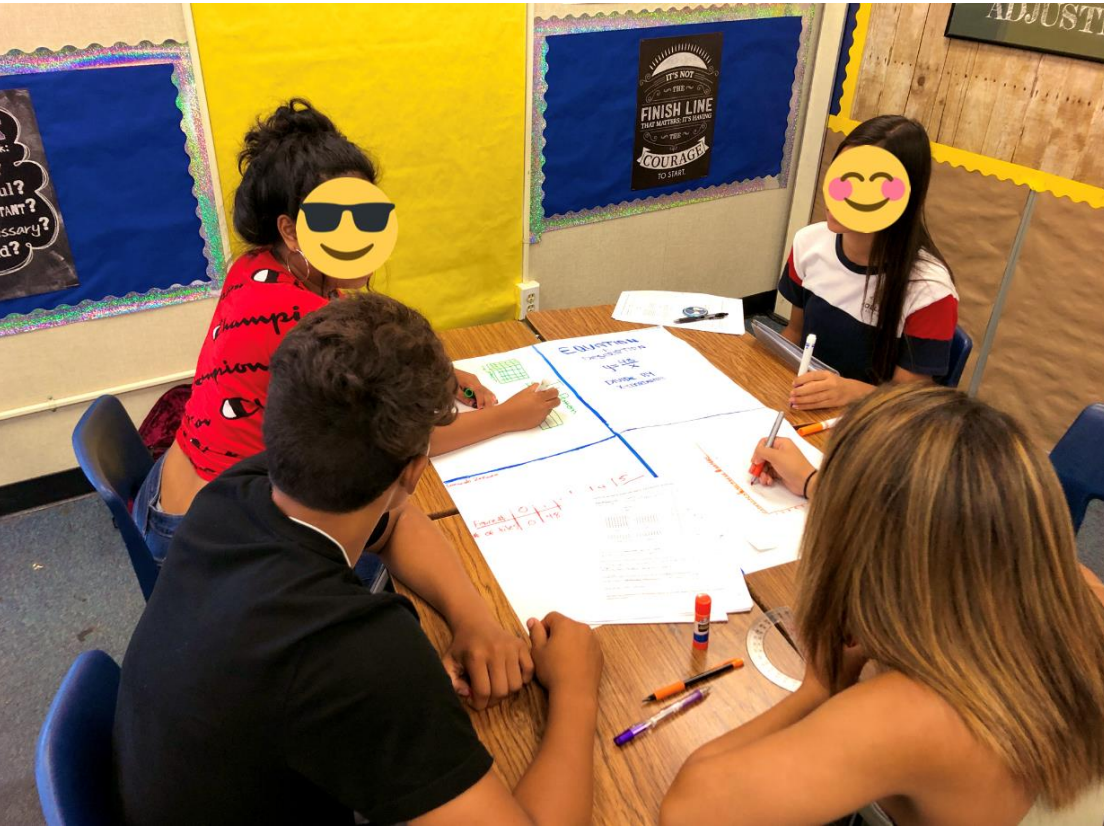
- share their thinking
- explain their reasoning
- listen to others' thinking
- be given immediate feedback
- give feedback to peers

Talking in Math Class

- To introduce concepts
 - Explore ideas, strategies, procedures, and facts.
- To clarify thinking
 - Use vocabulary in context, explain reasoning.
- To deepen understanding
 - Defend ideas and justify reasoning.
- To extend learning
 - Analyze reasoning of others and agree or disagree with their reasoning.



Five Major Reasons That Talk Is Critical to Teaching and Learning



- Talk can reveal understanding and misunderstanding.
- Talk supports robust learning by boosting memory.
- Talk supports deeper reasoning.
- Talk supports language development.
- Talk supports development of social skills.

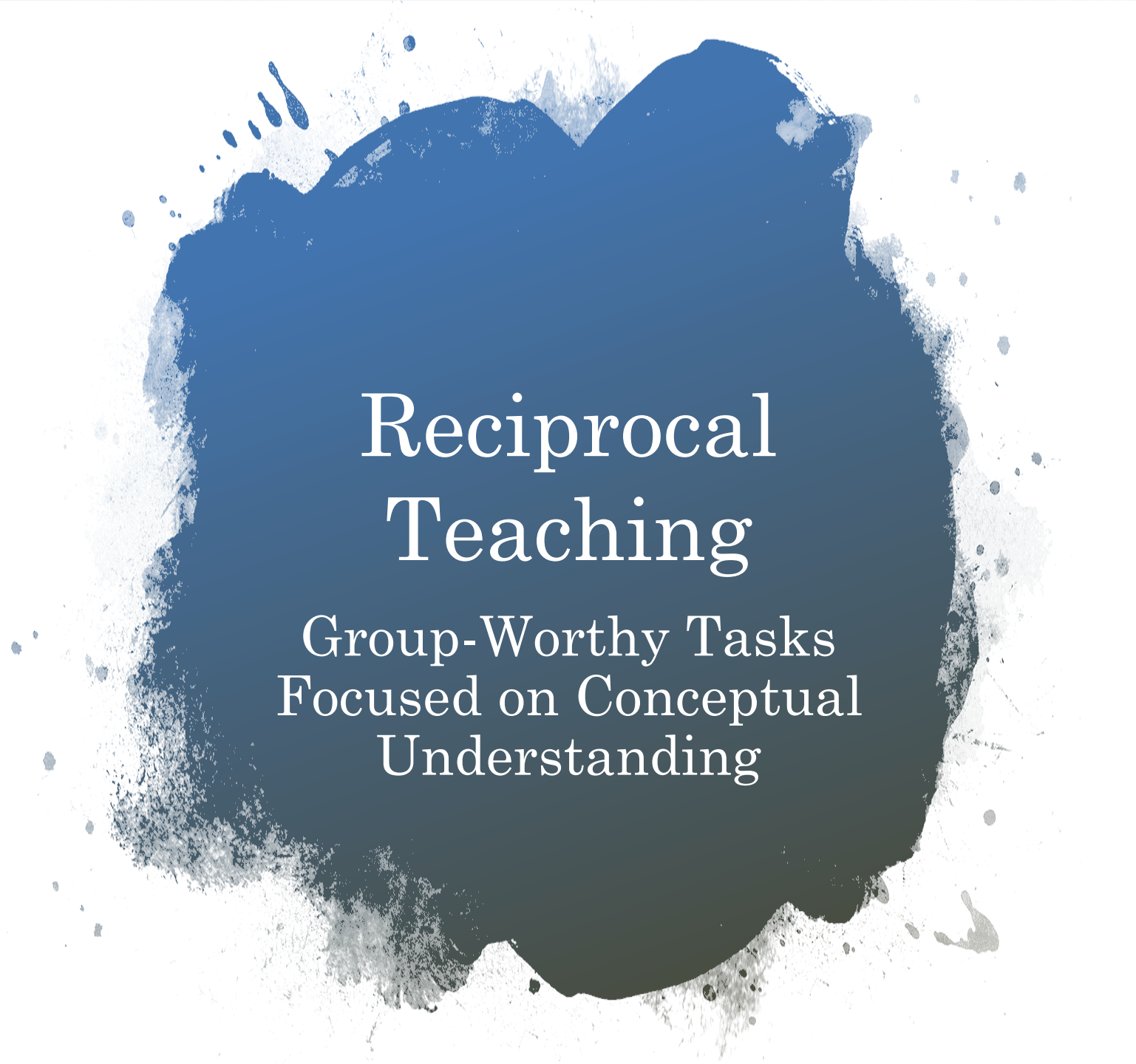
[Cooperative Learning in the Secondary Mathematics Classroom](#)

Use
structured
interactions
for EVERY
part of a
lesson.

Sources:

- [Kagan Publishing & PD](#)
- [AVID](#)
- [Teacherarium](#)
- [ASCD Collaborative Learning Routines](#)

Group Worthy Tasks	Guided Practice	Independent Practice
Reciprocal Teaching	Coach & Mathlete	Appointment Book Activity
Team Accountability Quiz	Whiteboard Drill	Student-Led AVID Tutorial Session
Participation Quiz	Numbered Heads Together	Scavenger Hunt
Collaborative Poster		



Reciprocal Teaching

Group-Worthy Tasks
Focused on Conceptual
Understanding

Reciprocal Teaching

- A collaborative group work structure originally developed for reading and comprehending informational texts.
- Original Segments: Predict, Question, Clarify, and Summarize



Reciprocal Teaching

- Every person on the team receives a reciprocal teaching role card.
- When it is your turn, read the questions/tasks on the card one at a time.
- Discuss each question and reach consensus with your team.
- After reaching consensus, everyone writes down the agreed upon responses.
- The summary at the end could be completed collaboratively or individually.

Reciprocal Teaching

Management Tips

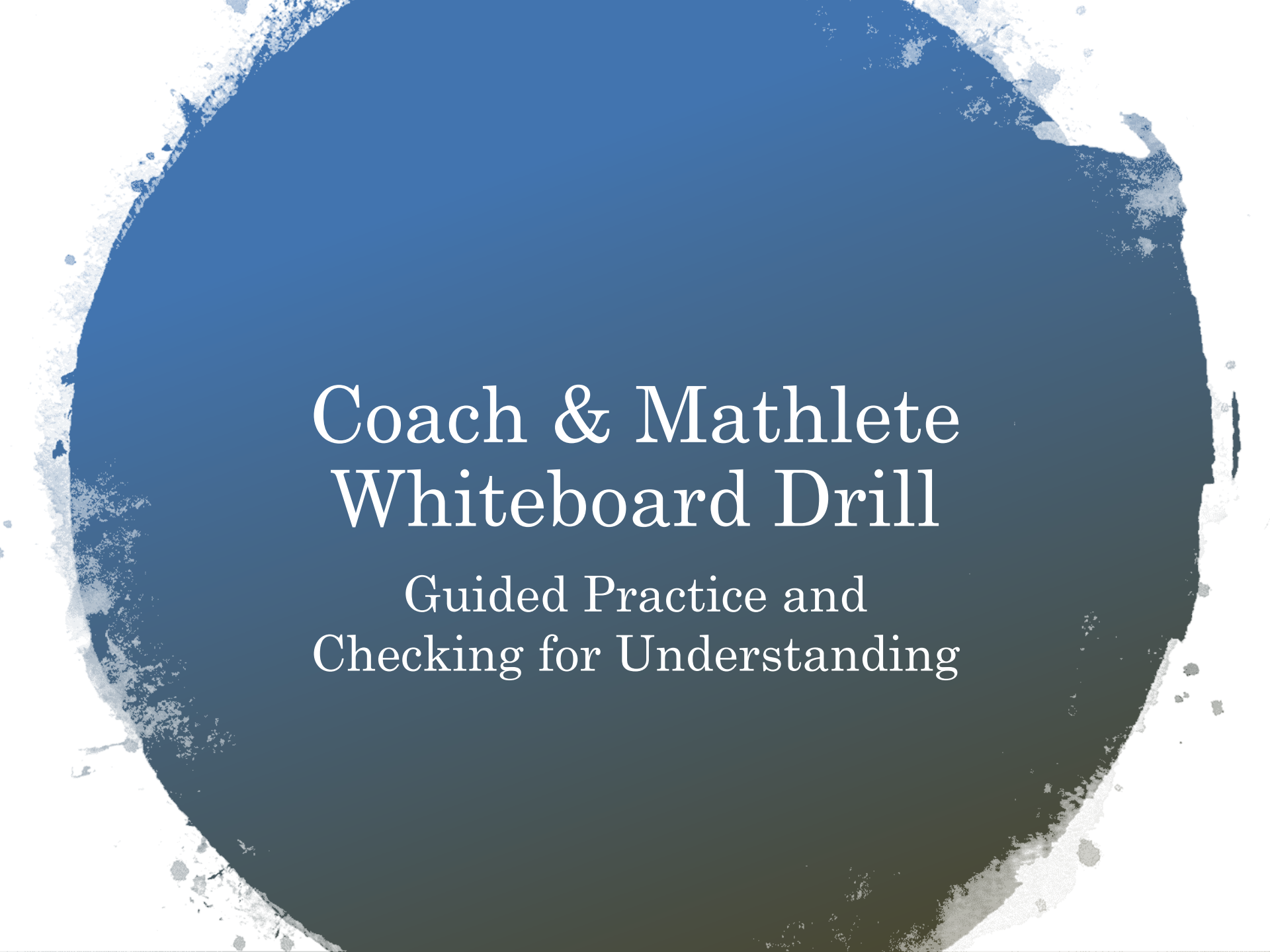
- Individual accountability: collect and grade one paper per team
- Rotate roles after each problem
- Change columns/titles of roles, depending on the problem and your goals for the lesson

Ways to Use the Structure

- Word problem analysis
- Break multi-step problems into manageable parts
- Investigate a new skill or concept



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Coach & Mathlete Whiteboard Drill

Guided Practice and
Checking for Understanding

Coach and Mathlete (with Whiteboards)

- Pair students and assign Student A and Student B (darker color shirt, birthday, Sitting on left, etc.)
- **Student A is the Coach for first problem**, and explains to Student B how to work out the problem step-by-step. (Cannot touch the marker/whiteboard)
- **Student B is the Mathlete** and does what the Coach says on the whiteboard.
- When done, they show the whiteboard to the teacher to check their answer/work.
- **Students switch roles for next problem.**

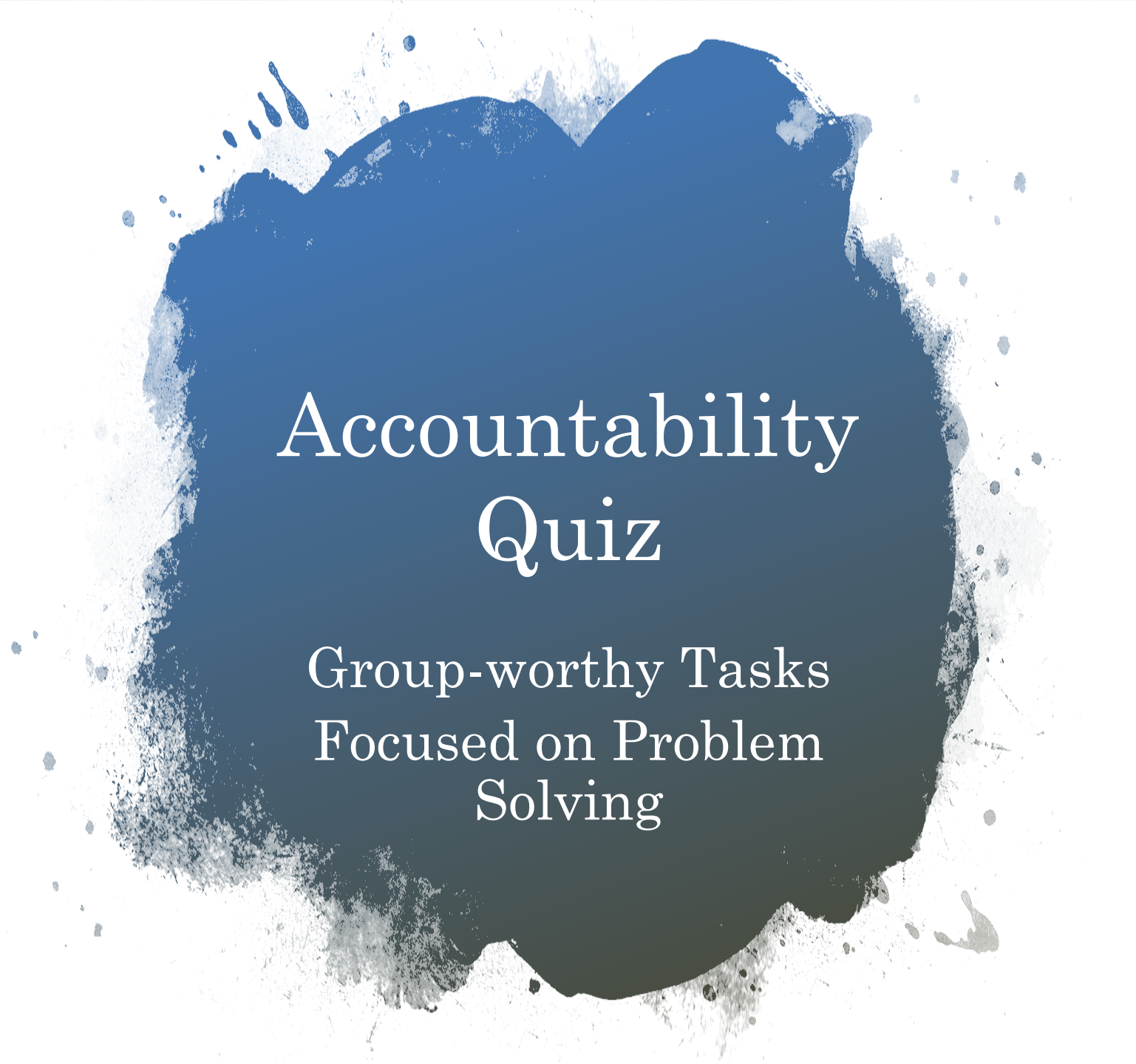
Coach and Mathlete

Management Tips

- Keep track of student progress on seating chart.
- When first pair is finished, allow them to take over so you can help students who are struggling, or let them do the tutoring.

Ways to Use the Structure

- Guided practice
- Checking for understanding
- Give immediate feedback
- Build fluency



Accountability Quiz

Group-worthy Tasks
Focused on Problem
Solving

Accountability Quiz

Management Tips

- Prepare 3-4 varied level questions
- Emphasize that it is the TEAM's responsibility to pass the quiz
- If a team member cannot fully answer a question the first time, circle back to their group for a second opportunity
- Assign a student with strong leadership skills as the Accountability Manager

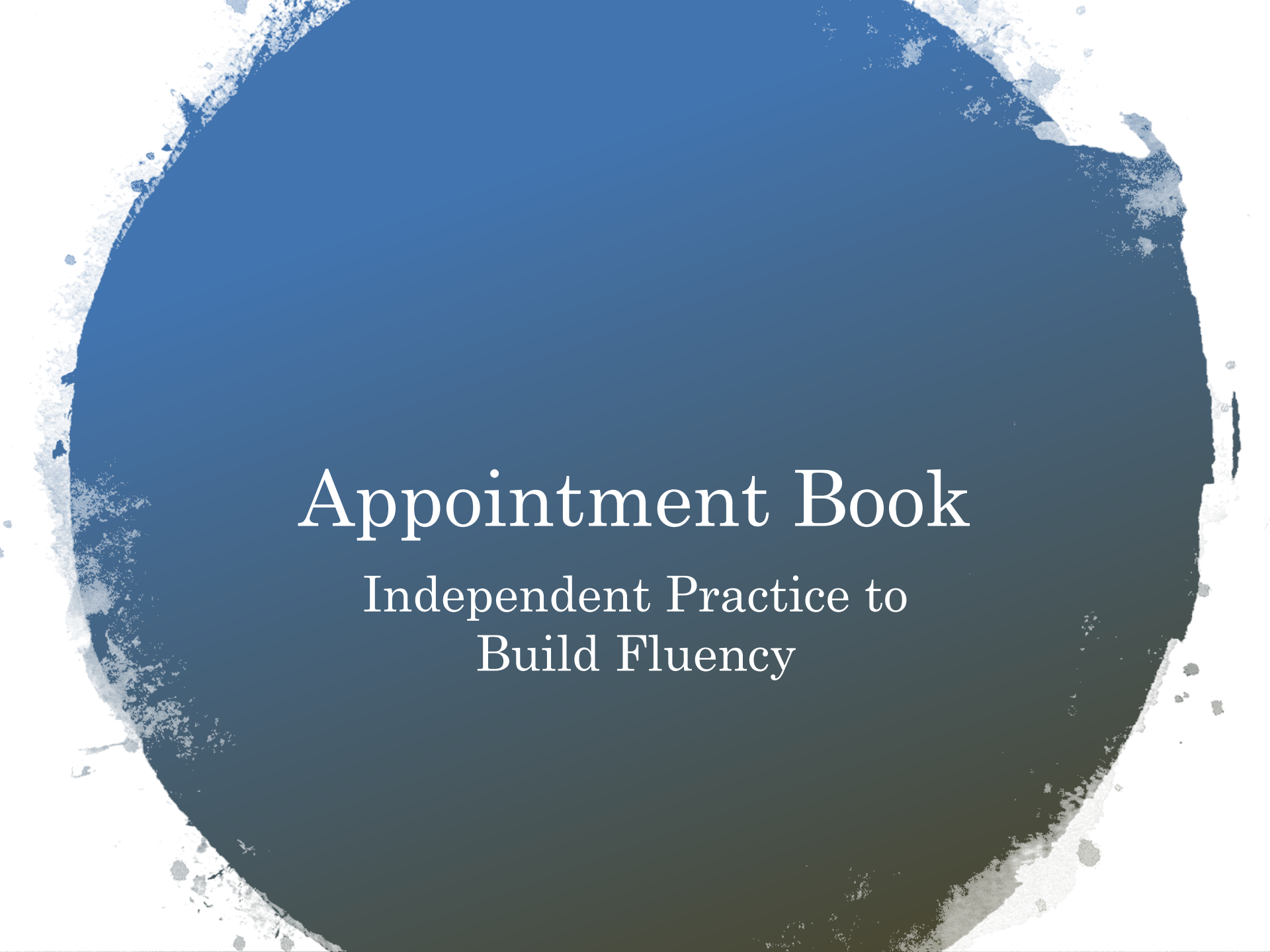
Ways to Use the Structure

- Focus on the HOWs and WHYs of mathematics
- Apply skills in a new context
- Team Assessment

[Teacherarium](#)



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Appointment Book

Independent Practice to
Build Fluency

Appointment Book Activity

- Make 6 appointments
 - 6 different partners who are NOT in your team
 - Stay on your feet until all 6 appointments are filled
 - When appointment book is full, return to your seat
 - Be ready for instructions



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Appointment Book Activity

- Meet with the appointment announced
 - Work with your appointment partner on the problem assigned
 - Listen to your partner's reasoning
 - Come to an agreement on the answer
 - Wait for the next appointment announcement



Appointment Book Activity

- Meet with the appointment announced
 - **Check your answers with your new partner!**
 - Work with your appointment partner on the problem given
 - Listen to your partner's reasoning
 - Come to an agreement on the answer
 - Wait for the next appointment announcement



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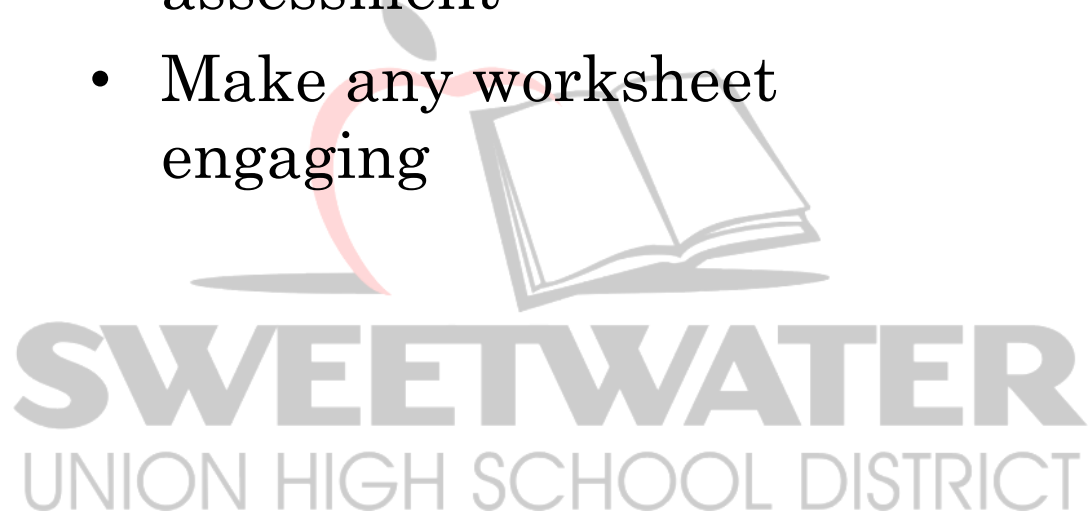
Appointment Book Activity

Management Tips

- Make sure students sit once they have made their appointments.
- If there is an odd number of students in the class, join in the fun, or have the extra student join a pair.
- Students **MUST** check all answers with each new partner.
- No time for copies? Use a document camera to post problems on board.

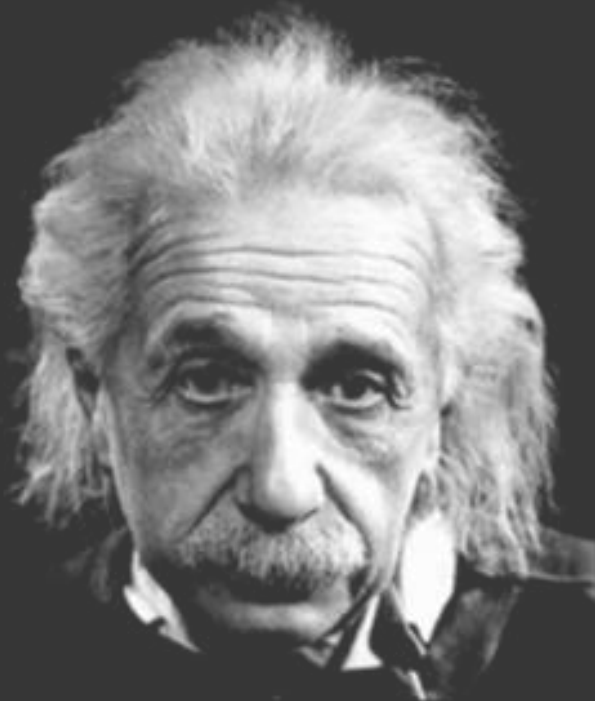
Ways to Use the Structure

- Guided practice
- Develop fluency
- Review for an assessment
- Make any worksheet engaging



Tips for Classroom Management

- Some structures work better than others for certain tasks/practice.
- Give clear instructions and be patient the first couple of times.
- Monitor while students are engaged in the activity.
- Use a timer to keep momentum through the activity, and use a signal to get students' attention.
- Activities work best when followed with closure.
- Stick to one or two strategies until they become routine before adding another.



**“If you can't explain
it simply, you don't
understand it well
enough.”**

Albert Einstein
smarty-pants physicist

Now you're talking!



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Pair up!

- Partner A: Has their bday 1st
- Partner B: Has their bday 2nd
- Partner A asks the question
- **“Which structure will you try first? What are some classroom management ideas you have for this structure?”**

After listening to Partner B, Partner A responds with **“I understood you said _____. I will try_____ and my ideas about it are _____.”**



PRESENTATION & HANDOUTS

bit.ly/talkmath_nctm2019



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$(\text{THANK YOU})^n$

$n \in \mathbb{N}, n > 1$

$\text{YOU} \in \{\text{Awesome People Set}\}$

ROMANCEMATH.BLOGSPOT.COM