# Reimagining Math Class: Teacher Moves to Increase Mathematical Agency and Access

Sarah Stecher

Find a table and design your name tent.



# In today's workshop we will...

- Engage in a mathematical group task as a learner
- Analyze a teaching interaction through an equity lens
- Identify specific teacher moves that disrupt patterns of domination and nonparticipation



## Get to know your groups

Each group member gets **1** minute to share the following. Decide who will keep track of time for your group.

- O Name, where and what you teach
- Pick one question to answer:
  - What does a "reimagined math class" mean to you?
  - What do you think is the biggest obstacle to student learning in a math classroom?
  - What drew you to this session today?



## Building an equitable classroom

Perceptions of student competence (status)



Cohen & Lotan

# What is our role in promoting equity?

#### Instructional

(Tasks, norms<mark>, teacher moves</mark>)

Institutional (School practices and policies)

Systemic (Macro-level societal context)  Use tasks and protocols that invite participation and disrupt power dynamics
 Make visible the brilliance of

all students





## The Joy of Jenga (Part 1)



# Your team will be successful at this task if you have someone who can...

- O Read carefully for key details
- Support an argument with mathematical evidence
- Visualize a 3-d shape based on the dimensions of its component parts
- Determine if an answer is reasonable, both numerically and practically
- Calculate surface area and volume
- O Organize and record your ideas in ways that help you make sense of it
- Make reasonable assumptions about a given context
- Communicate ideas clearly so that everyone in the group can follow the argument
- Convert units and consider scale
- O Switch between abstract and concrete representations of a scenario

No one is expected to do all these things but everyone can do at least one. You will need each other to be successful in the task.

#### Stop and Jot.

1. One thing I can bring to my group.

2. One thing I need from my group.





## The Joy of Jenga (Part 1)

The **READER** is the person who traveled the farthest to get to NCTM.

The **RESOURCE MANAGER** is the person who traveled second farthest to get to NCTM.

The **TEAM CAPTAIN** is the person who lives closest.

The **FACILITATOR** is the person who lives second closest.



## **Group** roles

### READER

- Reads each question out loud to the group
- Makes sure everyone is ready to move to the next question

## **RESOURCE MANAGER**

- Calls teacher over for team questions
- Gets supplies and makes sure everyone can access them

## TEAM CAPTAIN

- Keeps everyone on task and keeps track of time
- Makes sure group is following norms
- Takes over role of absent student

## FACILITATOR

- Makes sure everyone's voice is heard and all group members participate
- Makes sure everyone understands and can explain the group's strategy



Part 1: The Joy of Jenga

Jenga is played with 54 blocks that are stacked in groups of three to form a tower. Players take turns to remove a block from a tower and balance it on top, creating a taller and increasingly unstable structure. If the tower falls during your turn, you lose the game. Each block is three times as long as it is wide, and one fifth as thick as its length.

1. When the tower is first built, it is 27 centimeters tall. What is the thickness/height of each block? What is the length and width of each block?

2. Amazon boasts that the Jenga game comes in a "tube-shaped package with a handle for carrying and easy clean up." If the tower stands upright in the container, what are the minimum dimensions of the tube? What is its volume?



 Do you think this carrying case is the optimal way of storing the tower or is there a case that would use less material? Give a mathematical argument.
 MATH MEDIC

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## Jumbo Jenga (Part 2)



You can also buy a jumbo yard-game sized version of Jenga. The length of a jumbo block is 7.5 inches.



#### About this item

- If all the second second
- V PLAY ANYWHERE: Perfect for indoor or outdoor events such as parties, BBQ's, tailgating, group events, camping and much more. Use a permanent marker to add numbers on each block and write down rules corresponding to each number to add spice to the game or play it as a drinking game.
- V EASY TO CARRY: Includes heavy duty, high-quality & high-strength 10 Oz Canvas carry bag for easy storage and transport.
- SUPERSIZE YOUR GAME TO SUPERSIZE YOUR FUN! Gather round your friends to entertain any crowd, or play alone, designed for ages 8 to infinity! Makes for a very interesting and exciting gift. No complicated or awkward trying-to-figure-this-game-out eternity of rules in front of everybody.
- VUNBEATABLE QUALITY: Sustainably sourced from kiln dried New Zealand Pinewood. SANDED ROUND EDGES TO PROTECT FROM PAINFUL SPLINTERS \*Costs us more but your safety is our priority\*. NO splitting, cracking, twisting, & warping on blocks. Extra Smooth Finish for great playability. We offer a 30 day, no questions asked, 100% money back guarantee. It's simple! If you don't like it, ship it back and get a refund!
- 4. Figure out the other dimensions of a jumbo Jenga block. How tall is this tower at the beginning of the game?
- 5. How many times bigger is this tower than the original Jenga tower?
- 6. The tower grows as players continue stacking blocks on top. What is the tallest this tower can get? Explain your reasoning.
- 7. If we were to design a case for this game, what would be its minimum volume?
- 8. Does the way the blocks are arranged in the case matter? How do you think the manufacturer decides on the dimensions of the case?





#### About this item

- GIANT SIZE: Comes with 54 large precision-crafted wood blocks 7.5" x 2.5" x 1.5" timbers for a ful 18 storey / 2.25 ft. tall tower the HIGHEST in the market!! (Can grow to over 5-feet) while playing) + Enjoy the free Wood Care Oil along with another small gift that awaits you inside.
- V PLAY ANYWHERE: Perfect for indoor or outdoor events such as parties, BBQ's, tailgating, group events, camping and much more. Use a permanent marker to add numbers on each block and write down rules corresponding to each number to add spice to the game or play it as a drinking game.
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□ Report incorrect product information.

# **Unpacking the experience**

Oldentify a specific teacher move you saw modeled during the Jenga activity. How does this move...

- Challenge ideas of what it means to do mathematics and who is mathematically competent?
- Elevate student voice?
- Impact how a student participates in the class?



# What does it take to do this work?

- O Examine your own beliefs about who in your class is capable of rigorous mathematical work and what that means.
- O Choose to read students differently. Have an asset-based rather than a deficit-based perspective.
- Elevate voices of students whose ideas are not often considered.
- Intentionally disrupt patterns of domination and non-participation through norms, group roles, and how you set up a task.



# What's your biggest take-away?

Sticky note share-out.





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Today's Jenga task can be found on mathmedic.com. (Geometry, Lesson 9.7)

