Culturally Responsive Math

Marjorie Curry
Using the Ready for Rigor framework, Zaretta Hammond’s book gives educators a neuroscience-based approach to closing the achievement gap.
Triangle Vocabulary List

- Altitude
- Median
- Perpendicular Bisector
Culturally responsive teaching leverages the brain’s memory systems and information processing structures. Many diverse students come from oral cultural traditions. This means their primary ways of knowledge transfer and meaning-making are oral and active. African American, Latino, Southeast Asian, and Pacific Islander communities all have strong oral cultures. Each of these cultural groups uses the brain’s memory systems for turning inert information into useable knowledge. They use memory strategies to make learning sticky, like connecting information to a rhythm or music or by reciting it in interesting ways.
Triangle Vocabulary List - Revisited

- **Altitude**
  extends from a vertex and is perpendicular to the line containing the opposite side

- **Median**
  extends from a vertex to the midpoint of the opposite side

- **Perpendicular Bisector**
  perpendicular to a side and bisects it
The Ready for Rigor framework consists of four strands:

- Awareness
- Learning Partnerships
- Information Processing
- Community Building
The Neuroscience of Information Processing

- Input
- Elaboration
- Application

https://dataworks-ed.com/blog/2014/07/the-information-processing-model/
Building Intellective Capacity

- Ignite
- Chunk
- Chew
- Review
Elaboration

- Gamify it.
- Storify it.
- Make it social.
- Jennifer Gonzalez, educator and blogger.
- Cult of Pedagogy
Gamify It

Games are the power strategy for culturally-grounded learning because they get the brain’s attention and require active processing. Attention is the first step in learning. We cannot learn, remember, or understand what we don’t first pay attention to. Call and response is just a way to get the brain’s attention. Most games employ a lot of the cultural tools you’d find in oral traditions – repetition, solving a puzzle, making connections between things that don’t seem to be related.
Gamify It

- Sorting
- Grouping
- Bingo or Trigo (Lenape Regional High School District)
- Around the World
Gamify It

Polar Coordinates
Battleship

Setup:
Each player distributes his or her fleet on battleships on their grid system. The ships are of sizes 2, 3, 4, and 5 points long. Use only points of intersection. The ships may be fanned out along the circle or straight along a line. Be careful so that your opponent cannot see your grid system. Here is an example of what a player’s grid system might look like:

How the game is played:
The younger of the two players goes first. He calls out the polar coordinates of his guess as to where he thinks an opponent’s battleship might be. Opponent then says “Hit” or “Miss”. A hit should be marked with an “X” and a miss with an “O” on the blank grid system in order to keep a record of the game. Players alternate turns.
Gamify It – Your Turn

- Think of a lesson coming up within the next two weeks.

- How might you use sorting, grouping, bingo, around the world, or another method to gamify it?

- What materials will you need?

- Do you foresee any obstacles? If so, how will you overcome them?
Organizing learning so that students rely on each other will build on diverse students’ communal orientation. This communal orientation can be summed up in the African proverb, “I am because we are.” Even making learning slightly competitive in a good-natured way increases students’ level of attention and engagement. It’s why the T.V. show Survivor has been around for so many years; it’s a social-based game.
Make it Social

■ Row-Race

■ Problem Presentations

■ Line-Up

■ Write and Solve

■ Word-Play
Think of a lesson coming up within the next two weeks.

How might you use a row-race, problem presentations, a line-up, write and solve, or word play to make it social?

What materials will you need?

Do you foresee any obstacles? If so, how will you overcome them?
The brain is wired to remember stories and to use the story structure to make sense of the world. That’s why every culture has creation stories. In oral traditions, stories play a bigger role in teaching lessons about manners, morality, or simply what plants to eat or not eat in the wilderness because it’s the way content is remembered. Diverse students (and all students, really) learn content more effectively if they can create a coherent narrative about the topic or process presented. That’s the brain’s way of weaving it all together. (Bonus: It also offers a great way to check for understanding and correct misconceptions.)
Storify It

- Quadratic Formula (Pop Goes the Weasel)
  \[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

- Square Root Graph (Wheels on the Bus)

- King Solution

- Puh-puh-Please

  Put Nice Napkins

  Next to Plates
Flatland: A Romance of Many Dimensions by Edwin Abbott

- Excerpt page 2 – 3
- Perspective
Think of a lesson coming up within the next two weeks.

How might you use or your students use a story along with that lesson?

What materials will you need?

Do you foresee any obstacles? If so, how will you overcome them?
Cooperative Learning & Mathematics High School Activities by Dina Kushnir
Culturally responsive teaching doesn’t have to be some performance the teacher does to entertain students. It doesn’t have to mention race or reference culture at all. Instead, what makes a practice culturally responsive is that it mimics students’ own cultural learning tools. These practices are helpful for all students, not just minority students.
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