



4HS OF BELONGING-CENTERED MATH INSTRUCTION

"There should be no such thing as boring mathematics."

— Edsger Dijkstra

OVERVIEW

Foster a sense of belonging by having students respond to questions about their home, hobbies, hopes, and heritage, interviewing each other for the answers, and finally, by integrating the collected data into math instruction.

PLANNING FOR IT

WHEN YOU MIGHT USE THIS PRACTICE

- At the start of the year to cultivate strong peer relationships
- To help students identify the relevance of math to their daily lives
- To foster a sense of belonging and inclusion for all students

TIME REQUIRED

- ≤30 minutes over two class periods

LEVEL

- High School

MATERIALS

- Paper
- Pencil/pen
- [Interest Interview Questions Worksheet](#)
- Optional: recording devices or student phone with recording capabilities

LEARNING OBJECTIVE

Students will:

- Reflect on how mathematics is present in their everyday lives

- Sort and organize data from peer interviews
- Identify commonalities among their peers

ADDITIONAL SUPPORTS

- [Making Practices Culturally Responsive](#)
- [Adapting Practices for Students with Special Needs](#)
- [Making Classrooms and Schools Trauma-Informed and Healing-Centered](#)

CHARACTER STRENGTHS

- Curiosity
- Meaning
- Kindness

SEL COMPETENCIES

- Self-Awareness
- Social Awareness

MINDFULNESS COMPONENTS

- Focused Attention
- Open Awareness
- Non-Judgment

HOW TO DO IT

REFLECTION BEFORE THE PRACTICE

Take a moment to reflect on your current math curriculum.

- Where do you see culture embedded into the projects, examples, assignments, or other parts of the curriculum?
- Is your own culture embedded in your current math curriculum? How does this make you feel? What about your students' cultures?
- How do you think this might impact their motivation and/or interest in math?

INSTRUCTIONS

BEFORE YOU BEGIN

If you are unfamiliar with the cultural aspects of math learning and how math instruction can reinforce inequity, please consider reading one of the following articles before beginning.

- [Why \(Urban\) Mathematics Teachers Need Political Knowledge](#)
- [Critical Mathematics Education Recognizing the Ethical Dimensions of Problem Solving](#)

ACTIVITY

The goal of this practice is to integrate your students' culture into mathematics instruction.

Part One

- Share with students that they will be working on an activity meant to help you and them get a sense of the types of things they are interested in outside of school and how mathematics is involved in those things.
- Assign the [Interest Interview Questions](#) for homework to give students time to think about, develop, and write out their answers. The interview questions were created to gain knowledge about the student's home life, hobbies, hopes and heritage to help foster belonging in math instruction.
 - If given as homework, students should receive some sort of credit for it to help communicate the value of this assignment.
 - You can assign all the questions provided in the worksheet or you can choose a few of the questions in each category to assign. You can also add your own questions or change the wording of the questions as you see fit.

Part Two

- During the next period of class time, allow students to pair up to interview one another using the same questions given for homework.
 - Students can use their phone to record each other's interviews (a good way to integrate students' phones for classroom tasks instead of a distraction) or write notes summarizing their interview, if they do not have access to phones or other recording devices.
- Have the students organize the data into the 4H categories.
 - *Home* refers to consistent activities engaged at home or the properties of the home space (e.g., cooking, interactions with family, the heating bill, dimensions of the living room).
 - *Hobbies* are personal activities engaged in at least once per week (e.g., sports teams, social media, work, smartphone apps/games).
 - *Hopes* are personal aspirations, interests, or goals (e.g., desired career or major, making the varsity team, making my paycheck last all week).
 - *Heritage* is a connection to a tradition or a people that is a source of pride (e.g., local celebrities in the community, Black female mathematicians)
- Based on skill level, have students report frequencies and other descriptive statistics for each category.
 - As an alternative, it may be fun for students to see what their peers said and figure out ways to organize those responses into categories.
- Wrap up the activity by asking students:
 - *What stood out to you about your partners' responses or the class' responses? Why?*
 - *What are some commonalities in the responses?*
 - Thank them for sharing openly about their lives with you and their peers.

ONGOING STEP FOR TEACHERS

- Throughout the school year, use the data to generate word problems, create powerful examples and illustrations, and facilitate group discussions or discovery-based learning projects.
 - For example, when planning a unit on exponents or exponential functions, instead of using the illustration the textbook provides, you can use or build upon one of their students' interview responses on how "Youtube videos go viral".

REFLECTION AFTER THE PRACTICE

- How did students respond to the activity?
- What stood out to you about your students' responses?
- Have you noticed a difference in your students' engagement with math problems after you integrate information from this exercise into the lessons and assignments?
- What other steps could you take to make math more relevant to student's lives?

THE RESEARCH BEHIND THE PRACTICE

EVIDENCE THAT IT WORKS

A [mixed-methods study](#) of 419 mainly Black and Latino 5th-9th graders found that teachers' use of teaching strategies that connect classroom mathematical concepts to the outside world and that allow students to see themselves in the mathematics help predict adolescent's growth in valuing mathematics.

Furthermore, the act of identifying commonalities with peers can help [improve intergroup relationships](#) and [increase helping behavior](#), thus creating a welcoming learning environment for all students.

WHY DOES IT MATTER?

Teachers have the opportunity to promote inclusion and equity through how they teach math. [Equitable teaching practices](#), such as heterogeneous grouping and student responsibility for peer learning, in high school math can increase achievement and decrease inequities in math performance. At the individual level, this is important given that math achievement can [open doors](#) to higher education and career opportunities. But math achievement goes beyond simply setting up students for career success; it can also help students become [better citizens](#), more able to understand the world, and [contribute to transforming](#) it.

SOURCE

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