

Develop Deep Mathematical Understanding

	Early Childhood and Elementary	Middle School	High School
Develop Deep Mathematical Understanding	Early childhood settings and elementary schools should build a strong foundation of deep mathematical understanding, emphasize reasoning and sense-making, and ensure the highest-quality mathematics education for each and every child.	Middle schools should offer a common shared pathway grounded in the use of mathematical practices and processes to coherently develop deep mathematical understanding, ensuring the highest-quality mathematics education for each and every student.	High schools should offer continuous four-year mathematics pathways with all students studying mathematics each year, including two to three years of mathematics in a common shared pathway focusing on the Essential Concepts, to ensure the highest-quality mathematics education for all students.
What supports are needed to ensure students' development of the mathematical practices and processes within their daily mathematics instruction?			

s need to see us leNot all elementary teachers feel comfortable teaching math in the upper grades

Intense coaching for teachers based upon teacher needs
 Differentiated supports for teachers, leaders, parents, etc.

All levels should be tracked by ability level because we have students that are bored and act up in my class that have to be held up This way we can teach directly to the students that have the same ability level in class If you go too slow you lose the average and high level students and if you teach at an average pace, you lose the high and low, and if you teach at a fast pace, we lose the average and low...its a no win here in California and engage the students not enrage them. If you teach too fast, then I lose the lower level Professional development, so many elementary teachers don't think of themselves as math teachers.

Yes to this!! ^^

Opportunities to write and justify their reasoning
 Use frequent and short formative assessments to guide instruction and learning

Real life Examples for real life work

The students need the opportunity and support to talk about their understandings. Language learners especially need scaffolding of the academic vocabulary to build their understanding. The students also need the opportunity to engage in tasks that help build a visualization of the concepts.

Quality ongoing data about students

Professional learning and coaching for teachers for support

How can we measure deep understanding in all levels? Tools for assessment?

We also need less content so we can go deeper. Revise core to include optional topics.

Our state of NY only requires 3 years of Math (and if s's take Alg I in 8th, they only need 2 yrs)

Permission to fail at it initially. For both, teachers and students.

Support from school leaders and district superintendents and state leaders at the HS level for 4 yrs of Math

Cooperative Learning Structures

Curriculum set up in a user (student and teachers) friendly way

Lots and lots of examples and curriculum we can draw from.

Supporting families and parents to promote learning and teaching

Math modeling for lower grades. While himcm and m3 contests are great for hs. We really need this for pk-8

Content that is less Googleable even in face to face learning

Reteaching not just repeating!

Time to process, question, engage, and collaborate.

One major challenge is consistency. What supports are necessary to allow students to have these opportunities at every grade level, not just isolated ones?

Support from teachers that encourage the explaining of the "why" of mathematics

application of mathematics in real life situations.

Equitable resources and assignment of teachers (particularly at the secondary level)

Teachers will need to feel safe they can take the time needed to teach deeper, even at the cost of pacing falling behind

Here at Delhi Public School Vadodara at INDIA we are taking extra classes for all the children which required extra attention after regular school hours and monitoring the performance of each child individually.

Equitable
Family support
Support at all levels

Connect to story
Reinforce that speed doesn't mean mastery

I think that there should be more of an emphasis on teaching about the practices and less emphasis on content.

School leaders need to understand the practices and possibly experience them to better support teachers in shifting instruction with the practices in mind.

I am at a charter school on a base in New Orleans. We used investigations math k-5 and a different program in 6-8. I am a science teacher, my students are scared to get the answer wrong. They can work out a problem with the strategies but they cannot explain their thinking. This is also the struggle they have in science.

We use the

Authentic learning and knowing mistakes are good.

Commonality of understanding the math practices, teacher delivery (allowing students to explore versus giving them the strategies), allowing students to have productive struggles.

A deep understanding of the practices and how students might demonstrate them. Explicit instruction for both students and teachers into the practices.

Ongoing professional development that allows for collaborative planning and reflection

De-emphasis on mandatory assessments (including mandatory diagnostic/progress assessments)

Change the mindset/messaging about "fidelity". Many teachers are told to "teach with fidelity" to the textbook/program. But it should be about fidelity to the learning target (standards). Those are 2 very different things

How to determine if goals are met? How to determine if students know the goals?

We do a pretty good job in the elem school of developing concepts. The junior high teaches very procedurally as does high school. Focus is usually on testing and answer getting not.

Re-

Hands on learning opportunities with manipulatives.

For Early Childhood, parent support is important, as the little ones may not yet have the capability to think and learn Mathematically unless they see this modeled by the adults surrounding them.

Provide a rich environment whereby the children can manipulate on things, build representations, think mathematically, and apply Math in real life situations.

Teachers need to be given the appropriate PD to allow them to understand how to create real world and relevant learning opportunities. They need to give kids an opportunity to dialogue and

Re-engagement opportunities

Explaining standards to students daily

If students are not given the opportunity to practice what they are taught, they will not be able to apply this knowledge. The practice should involve real world situations where all the stakeholders are vested. i.e parents, students, teachers, school administrators. Parents will need the tools to support their children at home, a fact that is very noticeable.

Fewer standards in required curriculum -> more time to delve deeply
More focus on conceptual understanding at all levels.

21st century tech

h

into concepts

Develop conceptual understanding with procedural and support all learners meaning eliminate tracking to all access and true equity thapprTeache

It may not be how we were taught-

Teachers allowing themselves to try activities and maybe fail or succeed without always being scrutinized by parents, admin, etc. Especially with the new technology.

There should be more than just Algebra I, geometry, Algebra II, tr